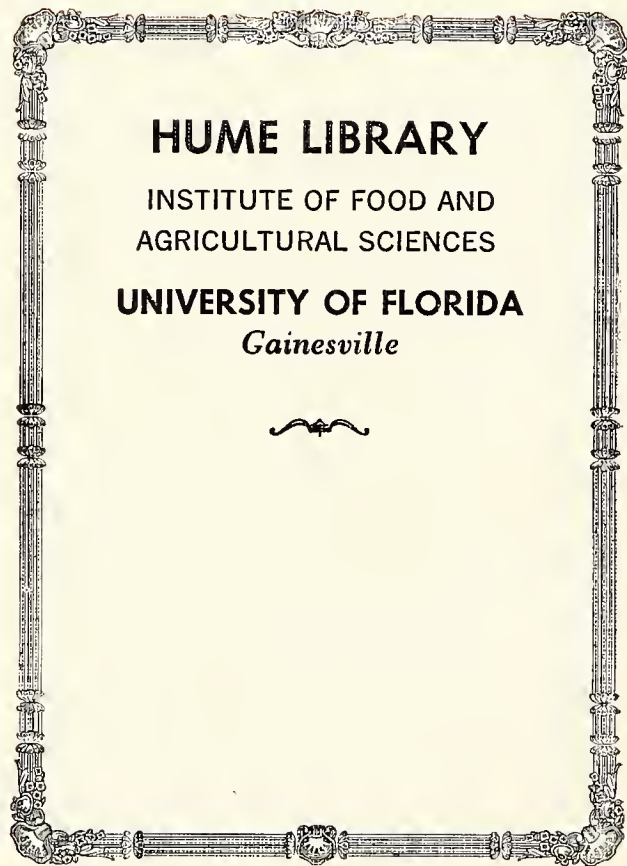


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**Central
and
Southern
Florida
Flood
Control
Project**

ORLANDO ●

● COCOA



● SEBRING



● FORT PIERCE



● CLEWISTON

● FT. MYERS



● WEST
PALM
BEACH



● FT. LAUDERDALE

● MIAMI



five years of progress...

1949-54

**Central and Southern
FLORIDA
Flood Control
Project**



**Five Years of Progress
1949 -- 1954**

**Central and Southern Florida
Flood Control District
West Palm Beach, Florida
November, 1954**

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Preface

Ever since white man first set eyes on the inland areas of the lower part of Florida, he has dreamed of bringing it under control for agricultural use. Its rich soils and the mild weather that prevails generally impressed him with its fantastic possibilities.

But the struggle has been a long one. When this land was turned over to the State of Florida in 1850, private interests undertook extensive reclamation, with a general record of failure. Then in a second phase, the State of Florida, through a public agency, attempted to open up the area. Some headway was made, but again success was not complete enough to satisfy and the quest for complete control of the area has continued. A third phase came into being in 1949 with the entry of the Federal Government into the picture, cooperating with state and local agencies in the Central and Southern Florida Flood Control Project.

The Central and Southern Florida Flood Control Project consists of a comprehensive system of works designed to produce substantial benefits by the prevention of flood damage, conservation of fresh water, increased land use, prevention of salt water intrusion, navigation and improvement of fish and wildlife resources. The project is large in terms of land area affected, population served and dollar value of property benefited. The impact of this system on the future economy of the State of Florida and the nation will not be fully realized for another decade.

The American people through their elected representatives at all levels of government are currently engaged in an intensive program to achieve maximum conservation and use of the nation's natural resources.

One of the most important facets of this program is conservation and beneficial use of water resources.

The Flood Control Project has served as a proving ground for many theories concerning the best methods of establishing cooperative enterprises involving natural resources development in which the Federal Government and local interests are cooperating.

As a pioneer in this type of cooperative enterprise, this worthwhile project is dependent upon participation by all branches of government from the local to the Federal level, equally with participation by individual landowners; an objective which is being achieved without the onus of socialization or the sacrifice of any rights, individual, county, state or Federal, but operating to the ultimate benefit of all.

It has attracted the attention of the Hoover Commission Task Force on Water Resources and Power, and will have a profound influence on the basic formulae to be adopted by the Congress at some future date for the distribution of costs in such projects.

The project involves close cooperation of the private citizen, numerous political subdivisions, the State of Florida and finally, the Federal Government. Without full cooperation on the part of all interested parties the project cannot succeed. Accordingly, it is of vital importance that its background, present status and future plans be understood.

Because of the extensive background of the project and the complicated nature of much of its work, no attempt is made here to render a complete report on its activities. Rather, this report is designed to present a comprehensive picture of the project so that anyone can visualize it and how it works.

Historical Background

A Land of Opportunity Beckons

Florida was opened to the Western World by a man looking for water. Although Ponce de Leon in 1513 did not find his fountain of youth, had he penetrated the interior, he would have found plenty of plain, ordinary water of the non-salt variety covering a large portion of the newly discovered peninsula.

Many centuries before the arrival of Ponce de Leon, prehistoric redmen lived along the shores of this immense natural water system. And various works still existing among the remains of their cultures show that they, too, had their water problems. Their difficulties with floods and droughts are not known, but they did dig canals for navigational and ceremonial purposes. Today these works can be seen easily from the air in the form of straight lines cutting through piney woods or in strange circles near mounds and other ancient earthworks.

The later Indians probably had their share in water projects, also, but the Spanish, who claimed the area for the better part of three centuries after Ponce de Leon, seem to have done very little in that respect. This is because they remained primarily in the upper reaches of Florida and around the coasts and had no real need for controlling the waters of the interior. Except for a very few signs thought to be Spanish, there is no known evidence that Florida's first white inhabitants attempted any water control at all.

FLORIDA TERRITORY ACQUIRED

By the time General Andrew Jackson received Florida from the Spanish in 1821 as United States Territory, few white men had ever penetrated the peninsula's wilderness, let alone actually attempted to remedy its unpredictable water system. But with the coming of settlers the need for control of this natural resource was soon to become evident. When

Florida came in as a territory, there were only a scattered handful of whites in the central and south part of the peninsula. A few Spaniards held on and finally had their claims honored by the new territorial government, as did a small group of Anglo-Saxons who had settled under Spanish or English rule. These people formed a very small nucleus which was to grow considerably in the next two decades with the southward push of settlers from the northern part of the territory and migrations from Virginia, the Carolinas, and Georgia.

With the presence of farmers and cattlemen in the territory, the Indian problem came up. Before it was partially settled the United States Army had fought a seven years war, losing fifteen hundred lives and spending twenty million dollars. After the war ended in 1842, scarcely more than three hundred Seminoles remained in the vast area of the lower peninsula. But the expected rush of new settlers to the territory did not come about even though Congress passed the Armed Occupation Act donating lands in certain districts on condition of actual settlement and cultivation. However, the war had caused exploration of the central and south parts of the peninsula by army units tracking down Seminoles.

GLOWING FUTURE VISUALIZED

Thus in 1847, two years after the northern stretch had gained enough population and satisfied other requirements to admit the rest of the territory into the Federal Union as a state, one of the state's first two U. S. Senators, J. D. Wescott, made the first known proposal to drain the overflowed lands of the lower peninsula. The senator's plan was based on reports of General William S. Harney, who had explored the Everglades area, and General Thomas S. Jessup, who

had directed operations in the Kissimmee Valley and the area west and to the south of Peace Creek. General Harney had written in January, 1848, "I do not know of a project that I regard as more calculated to benefit the country than this. It affords the Union the best kind of cultivated land that is wanted to render us, to a great extent, independent of the West Indies."

That same year the Secretary of the Treasury had appointed Buckingham Smith of St. Augustine to make a general inspection of the area and to report on his findings. Smith reported to the United States Senate in June, 1848, that he believed the Everglades could be reclaimed by a sensible system of canaling and by deepening the various streams that flowed both east and west to the coasts. Depending on aid from canals running into the Caloosahatchee, Lockahatchie, and St. Lucie Rivers, his idea was basically to follow the natural drains already existing. He believed like the others that drainage would insure the growth of a new agricultural empire in South Florida.

In 1845, when Florida entered the Union, the state had received 500,000 acres of land for internal improvement purposes. In 1850, undoubtedly nudged by the glowing reports on drainage possibilities in Florida and a request for overflow lands from the state legislature, the United States Congress passed the "Swamp Lands Act," which affected several states and which conveyed the whole of Florida's swamp and overflow lands to state ownership. This donation included the major part of the peninsula, and large areas of it were not swamp lands, of course. Although at the time it was thought to be near 12 million acres, it was later found to be closer to twenty million. An important stipulation in the act was that the sale of the lands to private interests should finance the necessary work of reclamation.

THIRTY YEARS OF TURMOIL

To plan for the development of this huge area, a board of internal improvements was created in 1851 by the legislature, consisting of the governor, the state officers, and representatives from each judicial circuit. The Register of Public Lands was charged with the responsibility of locating the lands and offering them for sale to private interests, while the offices of State Engineer and State Geologist were created to direct

actual drainage done under the policies and plans laid out by the board. By the next year commissioners were at work locating the donated tracts.

But by 1855 little, if anything, had been accomplished in the way of internal improvements by this early board. Transportation in the state was in poor shape. Although Senator David Yulee had long been a vigorous backer of railroad construction, twenty miles from Tallahassee to St. Marks, which existed before Florida entered the Union, was the only railroad in the state. The cumbersome board discussed many projects of varying natures, such as a ship canal which was even routed and surveyed, but nothing ever neared materialization. The significance of it all was that the settlement of the interior was impeded immensely by the lack of transportation facilities. Even the governor, who was a member of the board, said in 1852, "The progress of Florida, if it deserves that name, has no parallel within the limits of the Union in feebleness and insignificance."

Thus in 1855 the legislature passed a new act "to provide for and encourage a liberal system of internal improvements. This act created the Trustees of the Internal Improvement Fund who would be the governor, the comptroller, the treasurer, the attorney general, and the register of state lands. The Trustees were given control of the unsold internal improvement and swamp and overflow lands and were authorized at once to guarantee the payment of interest on bonds which might be issued under its provisions to aid construction of railroads from Jacksonville to Pensacola and from Fernandina to Tampa Bay with a branch to Cedar Key. In addition a canal from the St. Johns River on Lake Harney to Indian River was approved. The Fund had \$965,000 at its disposal, which with interest came to around a million dollars.

INTERNAL IMPROVEMENTS PROGRESS

The eve of the Civil War found the state progressing with internal improvements rather doggedly. Only a part of the proposed railroads were completed, Cedar Key being the southern-most terminal. By the time Florida seceded from the Union to join the Confederacy, bond issues totaling over three and a half million dollars had been made by the Trustees of the Internal Improvement Fund. Although the spotlight

in internal improvements had been necessarily on railroads, drainage plans in the central and south parts of the state had been held up by a new Indian uprising.

The Civil War saw several extensions of the railroads when Florida became one of the main sources of supply for the South and the growing cattle industry in Central Florida was feeding thousands of Confederate troops. But more railroads were torn up by both sides as they needed the materials and the cessation of hostilities found rail transportation set back again.

In the years of reconstruction by the carpetbag governments, the Internal Improvement Fund became so entangled in debt and politics that it was unable to accomplish anything actually constructive. After the war none of the pre-war chartered railroads had been completed, and now financially flat, they were taken over by the Trustees and sold. Although the sales went to various favored parties at appreciably less sums than their actual value, they enabled the Trustees to pay bondholders, or to retire bonds to the amount of \$2,872,700, leaving about three-quarters of a million still owing. However, it was discovered that some of the bonds had been bought up for a pittance, sometimes as low as twenty cents on the dollar. And not all the bondholders were willing to liquidate so easily. Owners of Florida railroads bonds were especially difficult to convince. One of these, Francis Vose, who claimed to have supplied the iron for the rails, insisted he owned \$195,000 worth of bonds purchased at par. Meanwhile subsidies for new railroads were being granted, amounting to a face value of over \$14,000,000, only a small part of which was ever devoted to the purpose named.

INCREASED LAND SALES TRIED

The Trustees tried to get the Fund out of debt by increasing land sales. In 1867 two contracts were made with private interests concerning reclamation. One offered to sell tracts of 640 acres at \$40 each for every 50,000 cubic feet of drainage works constructed in the swamp lands, while the other dealing with reclaiming area near the Kissimmee and Caloosahatchee Rivers, offered half of the lands affected, provided the work began within a year and was completed

in seven. One of the largest transactions came in March, 1870, when the Trustees gave the New York and Florida Lumber Company 1,100,000 acres at ten cents an acre for a project of reclamation and settlement when the market price was about \$1.25. In a following deal another plan for draining the Everglades was presented by the Southern Island Navigation Company, which had contracted to make a cut from the St. Johns River to Biscayne Bay. Generous grants were made to the company, but the grants were located in wild and unsettled areas of the state and made contingent on certain improvements. But before further sales could be made, creditors of the Fund forced a showdown, and on the basis of irregularities, the District Court of North Florida put the Fund in the hands of a receiver. Also Francis Vose had an injunction which prohibited the sale of improvement lands for anything except United States cash.

Thus by 1877, when actual home rule returned to the state, Florida possessed an Internal Improvement Fund in receivership, several millions in worthless bonds, and taxation which had risen to \$286,280. After futile negotiations with Vose, the Trustees continued to sell parcels of land through the receivership and the monies were used to settle claims and judgments against the Fund. But the ordinary sales of land were not enough to keep the debt from increasing and the Fund was being depleted by compound interest and the expense of litigation.

The Trustees had employed agents to sell large tracts at twenty-five cents an acre. These representatives were touring both North America and Europe seeking buyers who would relieve the Fund from utter wreck. Several offers for the purchase of large tracts at prices as high as twenty-eight cents an acre on a part cash, part credit basis were received from 1875 to 1880, but the Trustees were forced to reply that the land could be sold for cash only. The creditors who had placed the Fund in receivership would not consent to contract sales. Meanwhile, the owners of the Vose interest were buying up other claims, planning to approach the federal court supervising the receivership and either take over the lands or force their sale for settlement.

Samuel A. Swann, an agent of the Trustees, was authorized to negotiate the sale of three million acres at not less than thirty cents an acre. He spent the years from 1877 to 1881 with northern capitalists and

English financiers. He actually had perfected details for a sale in 1881 when, before his deal could be closed, creditors forced the Trustee's hand by appealing to the court for an order to sell the Fund's lands,

now some 14,000,000 acres in all. An immediate buyer of a large tract had to be found by the Trustees to save the Fund from disaster, and a search was begun to find him.

The Disston Era

The Trustees found their man. He was Hamilton Disston, a Philadelphian who had inherited his father's saw works a few years earlier and now at the age of thirty-seven was already risking a fortune in what most northerners regarded as a tropical wilderness. His two gigantic deals with the state led to the long-delayed opening of Central and South Florida. On February 26, 1881, Disston had already made the first contract, which was to drain overflowed lands south of Township 23 East and east of Peace Creek in return for half the area reclaimed in the form of the odd sections in each township. But because of pending litigation, it was beyond the power of the Trustees to give clear title to these lands. When the new governor, William D. Bloxham, saw the situations of both Disston and the Fund, he took matters in his own hands and induced Disston to purchase outright four million acres on the peninsula for a million dollars. By this sale of May 30, 1881, the Trustees of the Internal Improvement Fund were able to pay off the debts and to assume an independent position for further land disposition.

This transaction not only allowed Disston and associates to proceed with the drainage contract in the Kissimmee-Okeechobee-Everglades watershed, but it opened the way for the Trustees to promote railroad development over the state. At the session of the legislature in 1881 numerous charters were granted to railroad companies, accompanied by grants of land. Although the law provided that railroads receive 3,849 acres for each mile built, eight, ten, twelve, and even twenty thousand acres were granted by the legislatures in the 1880s. Henry B. Plant, who had already begun to buy railroads in the state, now started his push down the interior to the west coast. By the next year the line had reached Kissimmee and in February, 1884, had connected Tampa to the North. Four years later Henry M. Flagler was laying his tracks down the east coast. During these years Internal Improvement lands

were going fast. By 1884, over three million acres had been deeded to railroads, four million acres on the Disston Purchase, and twenty-three thousand acres to selecting agents and others.

Soon after Hamilton Disston's second contract with the Trustees, which had gotten both favorable and unfavorable comments in the state, he sold half of the four million acres to Sir Edward Reed, who paid a half million dollars direct to the Internal Improvement Fund toward Disston's purchase. Whether or not Disston received anything else as profit on this transaction is not known. For handling the sale of the two million acres remaining, the Disston Land Company was formed in Philadelphia with Disston taking in more financiers. This corporation was broken down into several Florida companies working in different areas of the purchase. Among these were the Florida Land and Improvement Company, the Lake Butler Villa Company, and the Kissimmee Land Company. Immediately land began to be sold to settlers and activity on the peninsula bustled. The town of Kissimmee sprang up on Lake Tohopekaliga as the Florida base of the Disston enterprises and the center for colonization to the south.

DRAINAGE COMPANY ORGANIZED

The Atlantic and Gulf Coast Canal and Land Company was formed to handle the drainage contract and was soon at work. The ideas of James M. Creamer and the other Disston engineers were to come closer to representing the present comprehensive project than anything else in the records. It was a plan for systematically draining a large area as a unit, and although never fully completed, it had some success. The first project was to give Lake Okeechobee an outlet to the Gulf through the Caloosahatchee River.

After surveys, work began at Lake Flirt in January,

1882. Within a year, the lake's waters began to flow to the Gulf through the cut and Okeechobee's level dropped considerably.

A second operation began in the upper Kissimmee valley with the cutting of the Southport Canal between Lake Tohopekaliga and Lake Cypress in July, 1882. Finishing the cut, thirty-six feet wide and six feet deep, the dredge turned to connecting Lake Tohopekaliga with East Lake Tohopekaliga, or Little Tohopekaliga as it was then sometimes called. This canal, to be called the St. Cloud Canal, was begun in January, 1883, and completed in September, 1884. It lowered East Tohopekaliga three feet the first thirty days after completion, and turned it from a "cypress lake" to one with a wide sand beach.

By the Fall of 1883, the company had opened navigation from the Gulf to the town of Kissimmee. Other work in the Kissimmee valley consisted mainly of improving the natural channel.

GLOWING REPORT SUBMITTED

Although the company was to continue operations until 1894, recapitulation of completed work in 1885 told a significant story. Chief Engineer and General Superintendent Kreamer reported the progress of the operations to the directors in February of that year in very glowing terms. Through canals and improvements covering forty miles and costing two-hundred and fifty thousand dollars, an estimated three hundred and sixty miles of inland waterway navigable by fair sized steamboats were a reality. The company had received 1,155,432 acres of land for its drainage work, equal to a tract one mile wide and over eighteen hundred miles long, although one legislative committee in 1885 claimed only 80,000 acres had been permanently drained. Despite controversy on the acreage drained, Kreamer had his eyes on draining seven million more acres before completing operations.

The growing of sugar cane seems to have been in the forefront of many minds since the days of Senator Wescott. Now, finally, some was planted. A tract of land on the Southport Canal, previously under three feet of water, was put in cane in February, 1884, and harvested later with much success. This endeavor probably convinced Disston that sugar production was right for the reclaimed lands. Already having a sugar

expert from Louisiana in Captain Rufus E. Rose, one of his engineers, Disston opened a sugar plantation in January, 1886, just east of the St. Cloud Canal on East Lake Tohopekaliga. After a small "open kettle" mill was installed the following year, Philadelphia contractors built in 1888 what was the first modern sugar mill in the state and reclaimed lands adjacent to the mill were doubled in cane.

This venture saw some success in its earlier years. But by 1894, after several managerial turnovers, speculative schemes instead of honest attempts toward production led Disston to look into the operation. Production improved and at one time the field of approximately 400 acres was yielding as much as 6,000 pounds of raw sugar per acre for refining in Savannah. After Disston's untimely death in 1896, the St. Cloud plantation operated on, but it seemed to have been doomed. The last cane was planted in 1899, and the mill's machinery was sold in 1901 to Mexican sugar operators. Mismanagement was the plantation's primary downfall, but the lifting of the federal bounty on sugar cane and the presence of cane borers, which had inadvertently been brought in with seed cane from Cuba, contributed to its death.

After several canals improving the Kissimmee River system were completed and while steamboats were having their heyday, the last phase of the operations of the drainage company began in the late eighties. An attempt was made to connect the group of small lakes northeast of Tohopekaliga and to tie them into that lake.

Perhaps because the company had already completed certain contract requirements, work stopped around 1894, although the plan to connect with Lake Tohopekaliga was not completed.

DISSTON OPERATIONS CEASE

After Disston's sudden death in 1896, his empire in Florida quickly crumbled. The Disston Land Company had already mortgaged its holdings to a Philadelphia trust company for two million dollars following the national panic of 1893. Disston's family, who had never approved of the Florida venture, were not interested in saving it. By 1901, pressure from bondholders forced the court to liquidate, and the remaining estimated 2,000,000 acres were sold for \$70,000

to two bondholders who represented most of the mortgage. The lands went into the United Land Company, organized for that purpose, and 30,000 valuable acres in the St. Cloud area later became the property of the Seminole Land and Investment Company. Several offsprings of the Disston Land Companies were still operating in the nineteen-twenties and one or two descendants remain today.

Several historians speculate that Disston lost a good deal of money in his Florida Empire, but the matter is highly debatable. Of all the lands his companies handled — a two million acre balance after his sale to Reed and another two million acres received on drainage work — only about half was left after his death. In some instances Disston and associates received ten dollars an acre for land for which they had paid twenty-five cents.

Available records on the work of the Atlantic and Gulf Coast Canal and Land Company are incomplete, but the District is now doing research on its operations because of their similarity to its own program in the Kissimmee Valley. Just how much the operations affected the water levels and the flood conditions of the lower peninsula is not clear, and there are many unsolved mysteries such as an Okeechobee-St. Lucie Canal planned as early as 1883, but never cut.

Disston's drainage project did not accomplish all that was expected and in some cases it led to over-draining. But it is important in that it was the first large scale project in the overflowed areas of Central and South Florida and the major part of it is still functioning today. It certainly proved that drainage of the area was a bigger and more expensive job than

anyone had speculated, and that water problems could not be solved simply by drainage. Probably Disston's historical significance lies just as much in that he broke the stalemate of the Internal Improvement Fund and thereby opened the development of Central and South Florida.

In gaining national attention it also started more comprehensive studies of the Everglades. Even so the peninsula's interior did not make the strides anticipated. Cattle, phosphate, timber, and citrus activities were to progress, but serious attempts at sugar cane, pineapples, rice and other crops in the Kissimmee Valley leveled off to token efforts. The big freeze of 1894-95 and the hurricane of '96 did not help matters, especially with the citrus growers. Although there was permanent settlement in some areas, and the coasts were to develop, a large part of the peninsula's interior remained a virtual frontier up into the nineteen-twenties.

On leaving the nineteenth century and looking toward the drainage days to follow, one last event is significant in the region which many years later was to come under the present Flood Control District. This was the U. S. Army Engineer's examination and survey of the Kissimmee-Okeechobee-Calosahatchee system in August, 1899, under the River and Harbor Act of that year. After reviewing much of the old Disston work, engineers recommended to the 57th Congress a number of navigational improvements which were approved and later completed. Thus just as the Disston empire was drawing its last breath, the U. S. Government was taking its first official look at the watershed of Central and South Florida.

Immediate Background

State Agencies Created

During the last decade of the nineteenth century it became increasingly evident that private action was not the most effective solution to the great problem of making this area into a substantial, well-developed territory, thoughts turned to public agencies, both at the state and national levels.

At first, the State of Florida undertook to handle the problem. The State Legislature created in 1905 a Board of Drainage Commissioners and turned over to them lands acquired in 1850 by the Swamp and Overflow Lands Act. This board was vested with authority "to establish drainage districts and to fix the boundaries thereof in the State of Florida" and to "levy thereon an acreage tax not exceeding 10 cents per acre per annum." They were also "to establish a system of canals, levees, drains, dikes and reservoirs . . . to drain and reclaim the swamp and overflowed lands within the State of Florida."

EVERGLADES DRAINAGE DISTRICT FORMED

The United States Court ruled against the constitutionality of the above law, resulting in an amendment by the 1907 Legislature. By the Act as amended, the Legislature itself specifically created the "Everglades Drainage District," defined its boundaries, levied an annual tax of five cents an acre upon the lands of the district, and authorized the use of the said tax for draining and reclaiming the lands with the District. Under this Act the "Board of Drainage Commissioners instituted the work of draining and reclaiming the Everglades."

Thus came into existence the Everglades Drainage District as a State agency which has functioned with ups and downs until its activity was absorbed into the present project.

During the first years of its existence, much of its work centered around studies to determine the practicability of drainage projects and in arriving at the best plans. Controversy over the project led Governor Napoleon Broward to ask the Department of Agriculture for aid in making a study. During the winter of 1907 and 1908, field investigations were conducted. The report prepared by this group developed so many questions that its publication was delayed pending further study and revision.

In 1912, Arthur E. Morgan, a special drainage engineer of the Office of Experiment Stations, made further studies that led to heavy criticism of the previous reports. A tally of the total drainage achievements to that point indicated negligible progress.

Actually, some work had been done, starting in 1906. The Trustees of the Internal Improvement Fund and the Drainage Commissioners purchased and operated dredges. In 1910, they shifted to a contract basis.

Records show that between 1906 and 1913, 225.4 miles of drainage canals were dug at a cost of \$1,836,000. This represented initial work on the Miami, North New River and South New River Canals.

During the 1905-1913 period, the Everglades Drainage District secured funds to carry on its work in two ways, by the sale of lands and by the imposition of the tax mentioned earlier. Although the value of land in the vicinity of the drainage work rose sharply, little was actually sold and the tax returns were small. Thus, change became necessary.

NEW APPROACH CONSIDERED

A Florida Everglades Engineering Commission, headed by Isham Randolph, entered into an agreement with the Board of Commissioners of the Ever-

glades Drainage District and the Trustees of the Internal Improvement Fund in 1913 to make a detailed study of the situation. On May 3, the Commission established headquarters in Miami and started to work. Its report was rendered on October 25, 1913, and subsequently was published as U. S. Senate Document No. 379, 63rd Congress, 2nd Session.

The report dealt with the "practicability of draining the glades" and made "recommendations as to the methods by which such drainage may be accomplished." It concluded that the drainage of the Everglades was entirely practicable and could be accomplished at a cost commensurate with the value of the reclaimed land.

The report recommended progressive drainage of the area. It contended that the drainage problem was primarily dependent upon the disposition of flood waters entering Lake Okeechobee from the north. The report further recommended a canal following the shortest practicable route from the Lake to the Atlantic Ocean. It concluded that such a canal could drain the extraneous flood waters from the Lake to the ocean and that the problem of draining the Everglades would be reduced to means of carrying off precipitation falling directly upon them. The report recommended a series of canals for drainage use including the utilization of some of the canals already in existence and the construction of others.

The Randolph report was largely responsible for the reorganization of the Everglades Drainage District by the State Legislature in 1913. The major change authorized the District to issue bonds based on tax returns. The tax structure was shifted to one based on benefits.

With the reorganization and the sale of bonds, real construction got under way and most people look to this period as the serious beginnings of work to reclaim the Everglades.

CONSTRUCTION ACCOMPLISHED

During the period 1913 to 1927, six major drainage canals and numerous minor canals, totaling 440 miles, 47 miles of levees, and 16 locks and dams were constructed. Total expenditures for these principal structures were approximately \$18,000,000. The funds were raised from the sale of bonds and from a special drainage tax levied by the Everglades Drainage District against the lands of the District.

The system of canals and locks constructed during this period has provided the groundwork for draining the northern and eastern parts of the Everglades region. The five major canals, which originate at Lake Okeechobee and flow easterly toward the Atlantic, drain part of the rich peat soil and at the same time relieve the coastal areas of surplus water. To supplement the principal water control facilities and to provide local water control measures, subdrainage districts were established.

The partial drainage of the Everglades opened the area to farm settlement. The first wave of settlers came between 1910 and 1915, followed by another from 1920 to 1926. By 1921, the population in the lake region was estimated to be around 2,000 persons. Most of the cultivated land in the glades was developed after 1920. The first crops grown commercially were sugarcane, tomatoes, beans, peas, peppers and potatoes. The establishment of the Agricultural Experiment Station at Belle Glade in 1922 helped to further farming in the area. The Station discovered the lack of trace elements in the peat and muck soils and thus solved the important question of the production of satisfactory quality crops on the organic soils. Their work also enabled farmers to treat their muck land so that its grass would sustain and fatten cattle.

Work progressed slowly during the 1920s, financed largely by successive bond issues, but came to a halt in 1929 when the Florida land boom collapsed and the depression was getting under way. By 1931, the Everglades Drainage District had defaulted on its bonds.

While the hurricanes of 1926 and 1928 essentially marked the end of the construction period under the Everglades Drainage District, they also marked the start of Federal interest in water control through the Corps of Engineers. The decade of the '30s witnessed the firm entry of the Federal Government into development and control problems of the Everglades.

Although some 440 miles of canals had been completed and \$18,000,000 expended, only the Caloosahatchee and St. Lucie Canals provided satisfactory outlets from Lake Okeechobee to the sea. The other canals lacked the slope necessary to reduce the Lake level appreciably. Moreover, the program had failed to follow the 1913 engineering plan in an orderly and progressive manner. Each succeeding Governor had

influenced his colleagues to adopt policies dictated by individual landowners and corporate property holders rather than by the needs of the District as a whole. As a result, efforts were so widely scattered that, on the whole, there was little return for the money spent.

It also became apparent that canals alone did not afford sufficient protection from overflow during unusual weather. The hurricanes of 1926 and 1928 created wind tides on Lake Okeechobee which overflowed into surrounding areas with disastrous results.

NEW DISTRICT ORGANIZED

To prevent a recurrence of these disasters, the Florida Legislature in 1929 created the Okeechobee Flood Control District which was authorized to cooperate with the U. S. Army Engineers in flood control undertakings. Prior to this time, the United States had engaged only in the improvement of navigation and had spent upwards of \$4,500,000 for this purpose on the rivers and harbors in the Lake Okeechobee area. A few levees along the lake had also been built by the Everglades Drainage District. After a personal inspection of the area by President Hoover, the Army Engineers drafted a new plan which provided for the construction of floodway channels, control gates and major levees along Okeechobee's shores. The Okeechobee Flood Control District was required to furnish all lands, maintain the works and contribute \$2,000,000 toward the costs of construction. A Congressional Act of 1935 reduced the contribution to \$500,000 and made the Army Engineers responsible for operation and maintenance, thus relieving the District of continuing responsibilities. Construction began in 1930 and by 1937, with the project substantially complete, the Federal Government had spent \$16,000,000 on the project. Maintenance costs and improvements had raised this expenditure to \$30,000,000 by 1952.

During most of this period, also, numerous subdrainage districts had come and gone in the state. A bulletin of the State Department of Agriculture in 1931 listed over a hundred; however, a report compiled in 1934 by the Federal Emergency Relief Administration contained material on 72 districts in 26 counties. The meager records available indicated all or part of approximately half that number were in the territory covered by the Central and Southern Florida Flood Control District. These districts joined together local interests and served as the tie-in between the major projects and the landowners.

When the Central and Southern Florida Flood Control District was created by the Florida Legislature in 1949, it absorbed the Okeechobee Flood Control District and also assumed the operating responsibilities of the Everglades Drainage District.

Federal Interest Develops

Federal entry into the picture in recent activity came originally through recommendations in connection with navigation. As early as 1927 a bill was introduced in Congress calling for a survey of the Caloosahatchee River drainage area to determine what control works were necessary for navigation in connection with flood control and a survey of Lake Okeechobee to determine measures necessary for flood control. This bill became law on February 14, 1927, and the report authorized thereby was submitted to Congress in April.

In this report the District Engineer stuck with the previous contention that outlets through the Caloosahatchee River and St. Lucie Canal, with improvements, was the solution to the problem. The construction of a proposed levee at the south end of the Lake was considered desirable to prevent the recurrence of

a disaster such as that which resulted at Moore Haven in 1926.

The flood control works were considered as being of great assistance to the reclamation of two million acres of land in the Everglades, and to some extent to the reclamation of lands draining into Lake Okeechobee. The water in the lake would be conserved for use in drought years for irrigation, and for protection against fire and frost. This program was considered favorably, but before any action could be taken, the hurricane of 1928, with its tremendous damage and loss of life, brought a complete reevaluation of the report.

In line with several different congressional requests, the plans were restudied and reworked, and in March 1930, the Chief of Engineers reported that if Congress

desired to make a substantial contribution to the project, he recommended one for navigation and flood control estimated to cost \$9,692,000, to which the State of Florida would contribute \$3,812,000. In addition, of course, the state would be required to provide all lands needed and agree to maintain the works within the Everglades Drainage District after construction.

In this report the Board of Engineers of Rivers and Harbors pointed out that flood control in the lower Everglades and the vicinity of Miami was entirely a local problem, that it was not dependent to any considerable extent on control of Lake Okeechobee, and that it did not affect any important Federal interest.

The Rivers and Harbors Act of 1930 adopted the recommendations of this report with several modifications; one, a reduction in the height of levees and two, reducing the required contribution toward the cost of construction by the State of Florida and other local interests. Subsequent legislation in 1935 further reduced the contribution of local interests.

Further Federal activity up to 1948 centered about refinements and expansions of the previously considered program.

Between the 1930 report and the 1948 report of the Engineers, not only had much more been learned about how to handle the problems of the area, but,

more significantly, Federal policy had changed. It was in June, 1936, that a national flood control policy was adopted by Congress. The Flood Control Act of 1936 established the policy that the Federal Government should improve or participate in the improvement of navigable waters or their tributaries for flood control purposes if the benefits to whomsoever they may accrue are in excess of the estimated cost, and if the lives and social security of the people are otherwise adversely affected.

DISASTER FOCUSES ATTENTION

Federal participation in the project seems to have been bought with tragedy and death. Although there had been many earlier floods and storms, the hurricane which struck Miami and the Lake Okeechobee region in 1926, with over 200 deaths and great financial losses shocked the nation and brought pressure to bear from many angles to prevent its recurrence by Federal action. Hardly had the ink dried on the plans drawn up as a result of this disaster than a more severe one struck. The hurricane of 1928 swept in through the Palm Beach area toward the lake. Wind-driven waters of Lake Okeechobee augmented by torrential rains

Overdrainage in the past has turned some areas into veritable deserts, with cactus growing where once lush vegetation flourished. This scene is in the Indian Prairie Canal region northwest of Lake Okeechobee where water control measures are putting this land into productive activity.





A study in contrast. Top view shows a flooded area at the city limits of Kissimmee in 1953, while the lower picture shows the same location when cattle were returned to grazing there some four months later.



overflowed the lake shore and drowned approximately 2,400 persons near Moore Haven in addition to the vast property destruction of the storm. The extent of the human disaster alarmed the whole state and provoked national attention, resulting in a new evaluation of the whole project by Federal interests.

As the Federal project continued slowly with improvements and changes in the original plan, an even more basic difficulty began to assert itself and the complex nature of the region was further revealed.

The successive extreme dry spells of 1931 through 1945 resulted in lowered ground water levels and the threat of serious salt water intrusion into the municipal wells of Miami and other coastal cities. When the water level fell in the Everglades area, salt water from the ocean rose in the wells upon which the cities depended. Here was an important relation between the areas around Lake Okeechobee and the other water resources of the region which had been overlooked in earlier efforts to drain the interior.

Furthermore, land which formerly was regularly flooded was now actually vanishing before the eyes of anxious owners. The peaty, organic soils of the Everglades were drying out and shrinking at a clearly visible rate. Thousands of acres caught fire and the muck itself was consumed and lost forever. Extensive

fire control measures were organized, but something was wrong with nature.

The situation grew worse as Florida recovered from the depression and experienced the economic stimulation of the arrival of World War II. High agricultural prices and demand encouraged the opening of vast acreages of land. A great strain was placed on the water resources of the area by the drainage and irrigation works which continued to expand, since the improvement of raw land in Florida does not tend to hold water in the soil, but increases the run-off into streams and lakes.

CYCLE COMPLETED

The pendulum of nature made a complete swing in 1947. It finally became apparent that the whole problem of proper water supply and control had been aggravated by uncoordinated efforts at improved drainage. The hurricane winds and rains of that year flooded three million acres of land in central and southern Florida for periods of many months. All the coastal cities suffered and the total damage of this disaster was conservatively estimated by the Corps of Engineers at more than \$59,000,000.

An improved pasture when the flood waters come. Because of the flat terrain, this water remains generally for a period of several months.





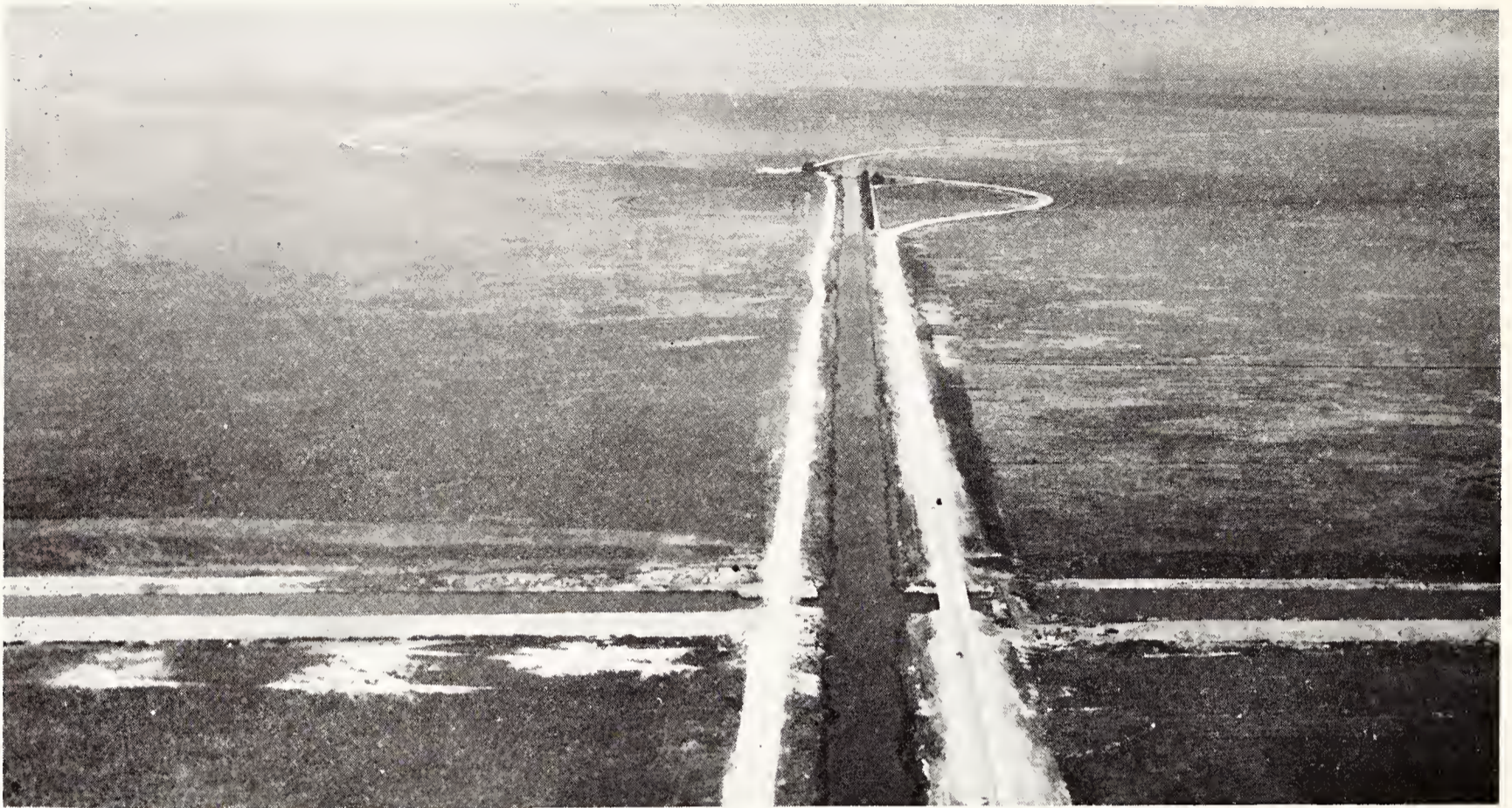
Cattle cluster on a high spot in their expensively improved pasture, which will be completely ruined when this water recedes. Below are two plantings typical of the pasture improvement program being carried out extensively in the Project area. This scene was taken just west of Ft. Lauderdale in 1948.

A planting of Pangola grass.



A well-developed clover pasture.





Drainage and water control in the flat, low lands of the Central and Southern Florida Flood Control District create problems found in no other similar project.

Flood water inundated outlying suburban areas of West Palm Beach; 30 percent of the city of Fort Lauderdale, including the business district, railroads, industrial and residential sections; large areas in the western part of Miami and the outlying communities of Miami Springs and Hialeah; and damaged roads, utilities, railroads and airports in the coastal area. Total damages for this area alone are estimated at \$41,900,000.

The devastation of this new tragedy made imperative a new approach to water control in central and southern Florida.

WHAT DID THEY LEARN?

By this time it became clear that "drainage" of the Everglades had come to a bad end. Nature had been disrupted. In turn, man had not sufficiently planned to restore the balance.

During the dry years with the resulting dehydration of the glades and the intrusion of salt water into the coastal areas, it became apparent that water conservation was just as much or more a necessary function of any plan as drainage. It became apparent also that

the very structures designed to drain certain areas and to protect them in time of flood were also depriving them of necessary moisture during other periods.

This was particularly evident in considering the parched agricultural areas below Lake Okeechobee and the lowering of the water levels on the coastal areas. In its natural state, for instance, the Kissimmee River basin drained into Lake Okeechobee, which, in turn, spilled its surplus water into the Everglades. From the Everglades the water ran slowly in a south-southwesterly direction to the lower end of the peninsula.

But the drainage project eliminated the natural flow of water and all the normal flowage from the Kissimmee basin was discharged into the ocean and gulf by way of the St. Lucie Canal and the Caloosahatchee River. Drainage projects designed to relieve the glades of all except their own rainfall also relieved them of water necessary to preserve a moisture necessary for the preservation of the very soil and for the maintenance of the underground water tables which prevented salt water intrusion.

The expansion of the Everglades Agricultural Area also tended to create a new problem on the flood side. As more land was put into cultivation, less land was

available as a “dumping ground” for excess water. The result was more serious and frequent flooding.

It also became apparent now that the excesses between an overabundance of water and a shortage during dry periods, spelled out a very definite need to store surplus water for use during the dry winter-spring season. A satisfactory level of water had to be maintained throughout the whole area if control was to be effective at all.

Many other things were learned in those years. Financing had been shaky. The drainage programs had been uncoordinated as between individual landowners, the drainage districts and the major areas themselves. Everything pointed in only one direction—that of formulating one master plan, involving all levels of activity, into which everything would fit. Out of that realization came the Central and Southern Florida Flood Control Project.

A general view of a vegetable-growing operation in the fabulously rich Everglades Agricultural Area. These operations are large scale and utilize the latest machinery and methods.





The total comprehensive plan of the Central and Southern Florida Flood Control Project is the largest earth moving job entered into by the Corps of Engineers since the Panama Canal was dug.



The Present Project

How It Came Into Being

Following the disastrous flood in 1947, the problems of the area came to a climax. This flood, plus the recent experiences of the drought in 1945 and the intrusion of salt water into the water supply fields and land of the east coast area, made it imperative that immediate corrective action be started to prevent further loss of life and damage to property because of floods, and to conserve water for beneficial uses during periods of drought.

Out of these years of experience had come the realization that certain lands would be better for cattle, others for citrus trees, still others for varied agriculture and some suitable only for conservation and recreational use. The development of the entire area required a single, carefully engineered water-control plan which would make the greatest total acreage available for the safe use of the people.

PUBLIC HEARINGS HELD

Acting upon the requests of many local agencies concerned with the subjects of flood control and water conservation, and under the authority of various flood control acts, river and harbor acts of Congress, and resolutions of appropriate congressional committees, the District Engineer of the Jacksonville District, Corps of Engineers, conducted public hearings throughout the area to determine the desires of the many local interests and to collect data from which to formulate a plan.

The opinion of the public developed at these hearings was that the problem was too large and complex for the capabilities of either state or local agencies acting alone. In addition, it appeared practically impossible to draft a plan that would be satisfactory to all. A comprehensive plan for flood control and water conservation which would embrace the whole area,

satisfy the major needs as expressed by the various agencies, be beneficial to the greatest number and to the largest portion of the area, and to be effectuated by the Federal Government, with local cooperation, seemed to offer the best solution.

COMPREHENSIVE REPORT SUBMITTED

The District Engineer, basing his decisions on the results obtained from these hearings, prepared a comprehensive report and submitted it to higher Federal authority on December 19, 1947. This report stated that the problems of flood protection, drainage, and water control were considered to be physically inter-related, and that the St. Johns, Kissimmee, Lake Okeechobee, Caloosahatchee, and Everglades Drainage areas all formed a single economic unit. Accordingly, it recommended a comprehensive program in the interest of "flood control, drainage and related purposes."

Millard Caldwell, then governor of Florida, approved the plan for the State in February, 1948. Approval by Congress as part of the Flood Control Act of June 30, 1948 followed, and the report was published in House Document No. 643, 80th Congress, Second Session.

One of the main features of the project as approved by Congress was the establishment of heavy state responsibility and the establishment of a single local agency with which the Federal Government could deal on all matters of local cooperation. To meet this stipulation, the 1949 session of the Florida Legislature created the Central and Southern Florida Flood Control District as a public corporation vested with all functions and assets of the Okeechobee Flood Control District, which was abolished. The same legislature provided for liquidation of the Everglades Drainage District and transfer of all its facilities to Central and Southern Florida Flood Control District by 1955.

The immediate and wholehearted assumption by the State of Florida of the responsibilities imposed by Congress indicated from the very beginning the readiness to cooperate. This has been expanded until today local participation in the Central and Southern Florida Flood Control District has attracted national attention and is influencing Federal thinking concerning such projects elsewhere.

Subsequent acts of Congress and the State Legislature appropriated funds necessary to initiate construction of the first phase of the project.

OVERALL PURPOSE STATED

The basic purpose of the overall plan, coordinated to form a single pattern, might best be stated by quoting directly from House Document No. 643. Here the Engineers said: "In its natural state the part of central and southern Florida considered in this report was a vast wilderness of water, forest, prairie, and marshland. The forces of nature had combined to establish a fine balance which supported the vegetable, animal and human life that prevailed and resulted in building up the land to the condition in which white man first found it. A large part of this land, the Everglades, was

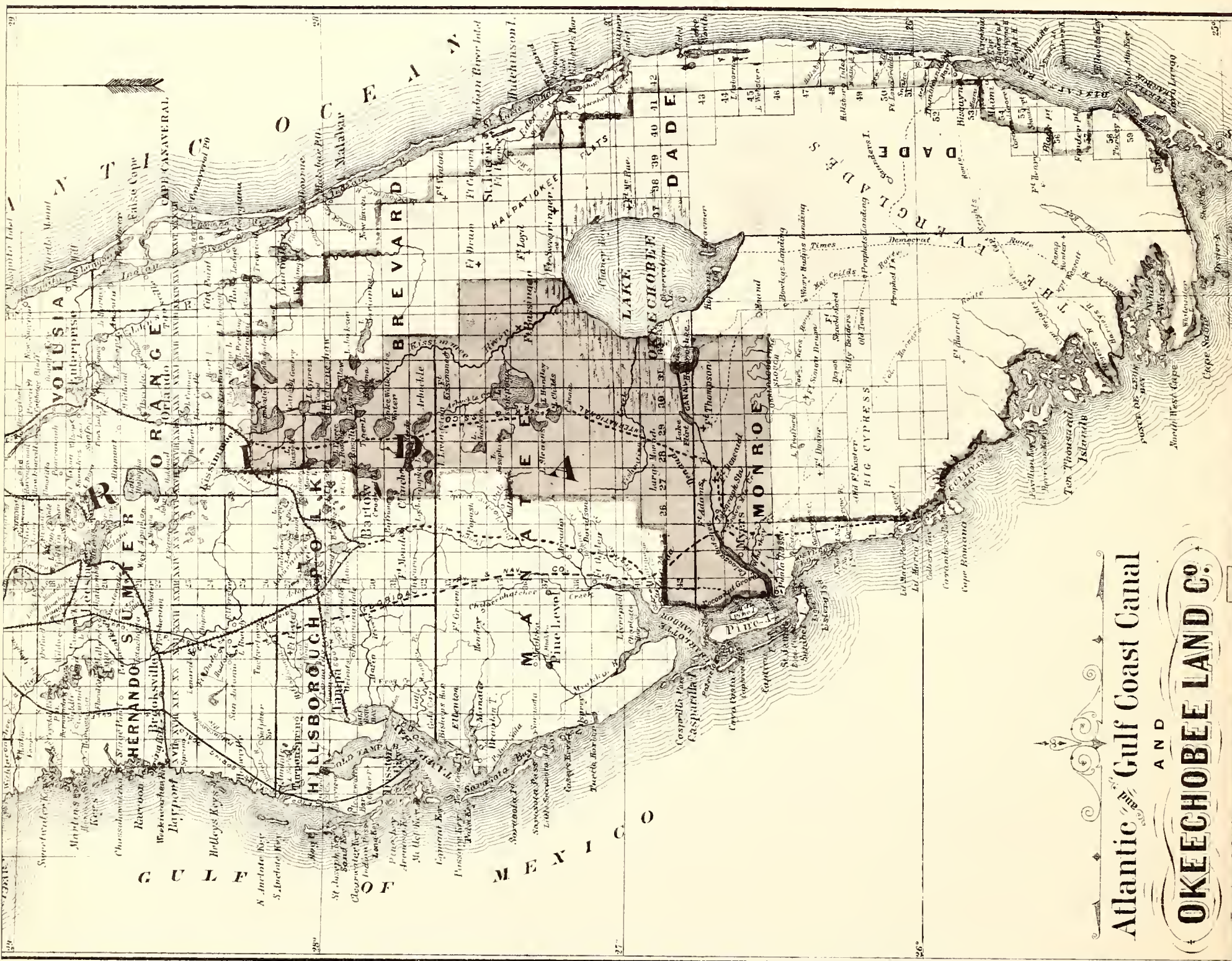
still in a formative stage when its development began. The inherent fertility of the area and its resources made its development and use inevitable. This development, however, resulted in physical changes which altered the natural balance between water and soil, and much of the development was undertaken without any real knowledge of the area or of the hazards involved. The parched prairies and burning mucklands of the Everglades in 1945, the flooding of thousands of acres of farms and communities in 1947, and the intrusion of salt water into lands and water supplies of the east coast are basically the results of altering the balance of natural forces. The basic problem of this area is, therefore, to restore the natural balance between soil and water in this area insofar as possible by establishing protective works, controls, and procedures for conservation and use of water and land."

BASIC FRAMEWORK PROVIDED

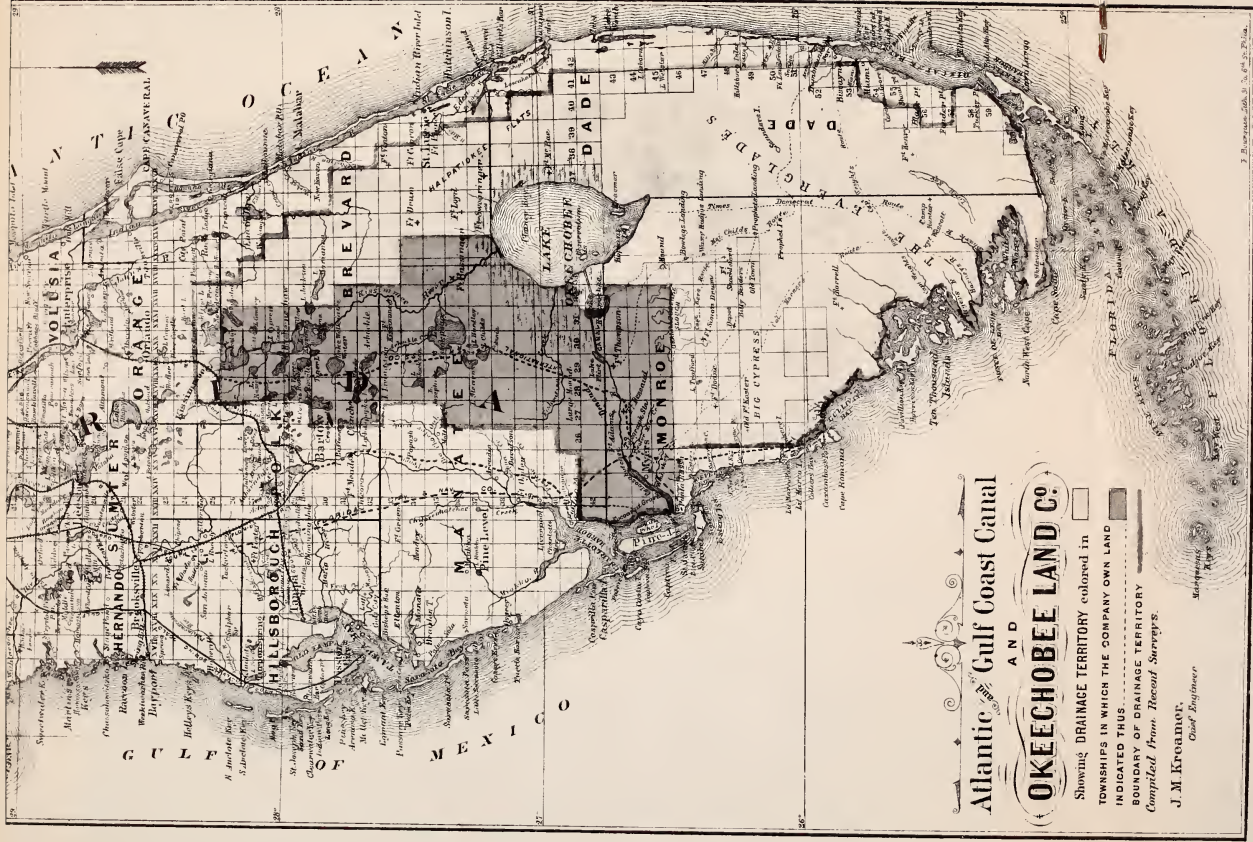
As approved by Congress, the plan provided a basic framework and laid down the fundamental principles of a project designed to prevent the majority of the damage due to recurring floods and droughts. The plan provided an interrelated and comprehensive sys-

Cattle raising is fast becoming one of the most important land-use operations in much of the area covered by the Project.

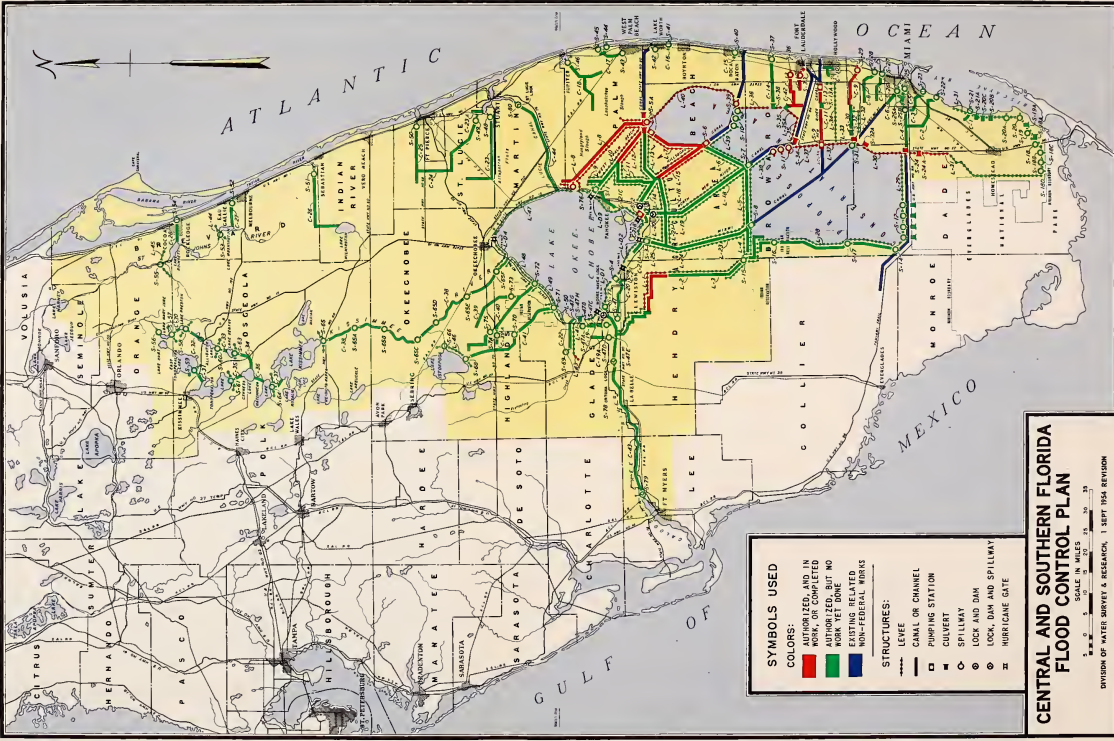




Atlantic Gulf Coast Canal
AND
OKEECHOBEE LAND CO.



Map taken from a report by the Chief Engineer of the Atlantic and Gulf Coast Canal and Okeechobee Land Company, a Disston organization, to the Board of Directors, 1888.



CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL PLAN

tem of water control to improve ground water conditions throughout the ten million acre area of the District. In varying degrees this plan was also designed to benefit cross-state navigation, recreation, municipal and agricultural water supplies, municipal and agricultural development, agricultural production, wildlife and fresh water fish, public health and sanitation, conservation of soils and water, and the control of both salt water encroachment and overdrainage.

The details of the plan and the estimates of the costs as made in 1947 are tentative only. Many years will be required to complete the construction of the project. The location, design and specifications of many of the features shown in the original plan, other than those already completed or under construction, will require further refinement or revision.

In general terms, the major works of the project may be said to be designed to:

1. Remove flood waters rapidly.
2. Store surplus water.
3. Prevent overdrainage.
4. Prevent salt water intrusion.
5. Protect developed areas.
6. Permit additional urban and agricultural development.

7. Navigation improvement.
8. Fish and wildlife conservation.
9. Ground water recharge, with incidental benefit of moderation of temperatures both high and low.

These objectives will be accomplished by an integrated system of reservoirs, channels, levees, pumps, spillways, control gates, and salt water barriers.

Removal of flood waters will be facilitated by enlarging and improving existing channels and in providing new ones where needed. Where gravity flow is not sufficient to carry off the water, pumping stations are being installed.

CONSERVATION AREAS ESTABLISHED

The storage of surplus waters is being taken care of in two major areas in addition to providing for controls which will render lakes throughout the area more effective as natural storage basins. First, south and east of the agriculturally usable lands in the Everglades, three giant conservation pools totaling 1,340 square miles are being provided by encircling levees. These pools are designed to impound waters from the

New acres of citrus are being added to Florida's already fabulous citrus industry as protection is being provided to sections not previously considered safe enough.



agricultural area of the glades and from parts of the east coast region. Spillways will connect the pools, and outlets will be provided into the Everglades National Park at the south end of the basins. The lands selected for these reservoirs have been determined by the State of Florida and the U. S. Department of Agriculture as not being suitable for long term agricultural use. Secondly, the levees around portions of Lake Okeechobee are being raised and lengthened to bring its use as a storage basin to maximum efficiency consistent with safety.

Control gates and spillways are being provided at appropriate locations in the project canals to control water levels.

Control of salt water infiltration will be accomplished in two ways. The control mechanisms on the canals flowing into tidal water will keep salt water from entering the channels during periods of low flow. At the same time, the maintenance of water levels in the system will control ground water levels and prevent encroachment of salt water into the fresh water aquifers along the coast.

Almost all phases of the program provide for protection of developed areas. Some areas require only a simple levee, while the protection of others requires a complete set of control mechanisms. It should be noted here that provisions were made in the original plans not only for protection of then existent developed areas, but also for eventual development of sections deemed worthwhile for expansion.

REGIONAL OBJECTIVES SET

Experience has shown that certain watershed areas of the District need to be considered as a unit. In the Upper St. Johns River basin, for instance, the tentative plan calls for the improvement of Lakes Poinsett, Washington, and Wilmington for water storage, with control structures at the lake outlets. Also, provisions are made for supplementary discharge eastward into Indian River during extreme flood stages.

In the Kissimmee River basin, the tentative plans utilize the many lakes as storage basins, with levees and control structures adding to their efficiency. Flood flows are to be accommodated by wider and deeper channels with proper controls. In the more southerly portion of this area, levee structures will divert water into Lake Okeechobee away from the rich agricultural

area to the south, while extensions of existing levees principally will give added protection to communities on the western shore of the lake.

Lake Okeechobee has been the center of activity in this territory since the beginning of drainage attempts. The comprehensive plans call for its continued service as a multiple-use reservoir with flood control, navigation and water conservation functions. Extensions and raising of levees with necessary water controls are designed to protect the surrounding countryside in times of flood conditions, and at the same time to increase the effectiveness of the lake as a water storage basin. Since the lake is part of the east-west navigation channel through the peninsula, modifications in the St. Lucie Canal and Caloosahatchee River facilities will be necessary to accommodate increased discharge from the lake.

The Everglades agricultural area will be encircled with a system of levees and canals and already a number of important modifications in the original plans are under consideration. Progressive encirclement was originally planned, but agricultural expansion exceeding expectations now indicates that outer encirclement as a unit and the elimination of the progressive stage plan will be more economical. The basic plan of improved and new canals with controls to permit maximum regulation of water levels is under construction. The perimeter levees will protect against runoff waters from adjoining lands.

Major features in the east coast area are protective levees to keep Everglades waters from entering the region and the creation of the water storage pools already mentioned. A major levee running down the length of the coastal area from Lake Okeechobee past Miami was one of the priority projects included in the plan and is basically completed at present. Further flood protection will be provided by improvement of coastal canals.

The western portions of Palm Beach, Broward and Dade Counties are being utilized for the water conservation pools. These pools will provide for storage of flood and surplus waters from the north and from the Everglades as well as from Lake Okeechobee. Storage within the conservation areas will provide for irrigation needs, recharge of ground water and aid in preventing salt water intrusion in coastal areas. A system of levees and canals will permit transfer of water as needed. The pools will also aid in preservation of fish and wildlife.

In the rich agricultural area below Miami an encircling levee will protect the area both from storm-driven ocean water from the south and east, and also from the flood waters of the Everglades on the west.

COSTS AND COST DISTRIBUTION

In its original conception, described in House Document No. 643, the project was estimated to cost approximately \$208,000,000. An initial phase of the work was formally approved for construction in 1948 and was estimated to cost \$70,000,000.

While the program proposed was not presented as one to be divided into separate phases, a compromise with time led to the designation of certain features as being the first phase and to initial legislative authorization limited to these items. Further studies by the Corps of Engineers and further development of the area involved have indicated that the original plans

were not entirely adequate. Some changes have been made by administrative action. Some of these, in the nature of major design changes, have a marked impact upon the cost of the works. The current estimate by the Corps of Engineers is \$280,000,000 for the entire project.

In House Document No. 643, 80th Congress, local interests are required to cooperate by furnishing 15% of the construction cost in cash, and all lands, rights of way, relocations, operation and maintenance and guarantees against damage. The local cash contribution is limited to \$29,152,000. The Federal Government is to provide for all other project costs.

The Flood Control Act of 1954 approved the total comprehensive plan as recommended in House Document No. 643.

The ground rules for division of cost in House Document No. 643, 80th Congress, call for a theoretical division of total economic cost at 61% Federal and 39% local. Experience has shown this cost breakdown is not very realistic.

The Flood Control District

Authorized By Florida Legislature

In laying down the groundwork for putting the comprehensive plan into action, the Federal Government specified that the State of Florida should create an agency through which it could work.

The Florida Legislature, therefore, put the project into motion by passing two laws of significance. The first, Chapter 378, Florida Statutes 1949, made general provisions for the organization of districts for the specific purpose of cooperating with the United States Government on authorized projects.

It is significant to note that this is a law of general application and is applicable to any district organized to cooperate on a Federally approved project. However, to date, Central and Southern Florida Flood Control District is the only such authorized project.

Under this general law, such districts were authorized to act for the State of Florida in meeting congressional requirements for state participation. It also set up in the general revenue fund an account to be known as the flood control account. The purpose of the account was to provide assistance to districts created under the law.

The law further provided that funds would be available, upon approval of the State Board of Conservation and upon proper resolution by the Board of Governors of the District, to meet allocated costs and that sums should be a grant to said District. In other words, the money was to be paid directly from the general fund without any provisions for its direct replacement.

Any district created under Chapter 378 was vested with the authority to cooperate with the United States or with the State of Florida, or any department or agency thereof, or with any county, district or governmental agency. Authority was also given to make cooperative agreements or commitments as the governing board should determine to be necessary for carrying out the purposes of the chapter. Specific coopera-

tive action authorized included those specified by the government in House Document No. 643, namely: the contribution of cash; the providing of lands, easements and rights of way; the furnishing of assurances to hold and save the United States free from damages due to the construction and operation of works of improvement and to maintain and operate the works after completion.

GOVERNING BOARD AUTHORIZED

Under provisions of the law, a district formed under it shall be directed by a Governing Board serving three-year staggered terms. These Board members are appointed by the governor, subject to confirmation of the Senate. No compensation is provided, but expense monies are granted while actually on work for the district.

The law further provides for the employment of personnel to carry out the projects of the district and to levy taxes to finance its share of the costs of the project.

The same Legislature in 1949 then passed a law (Chapter 25270) creating the Central and Southern Florida Flood Control District, as a 99-year public corporation, under provisions of the previously cited law. It set forth its boundaries, levied an initial tax on the property within the District, and provided for the abolishment of the Okeechobee Flood Control District, with all of its functions and assets being transferred to the new District.

The area embraced by the Central and Southern Florida Flood Control District covers some 15,570 square miles in central and southern Florida as shown on map which is a part of this report. All or part of 17 counties is involved.

ACTUAL OPERATION

The primary operational obligations of the Central and Southern Florida Flood Control District are those imposed by Congressional approval of House Document No. 643, that is, those directly connected with the relocation of utilities, the acquisition of rights of way and the operation and maintenance of all works except those for navigation and discharge of water from the conservation areas.

In addition, the District's activities are becoming more and more closely associated with the advance planning program in order that it may more effectively discharge its local obligation as the representative of the people of Florida. Another area of responsibility, principally on the local level, is entailed in carrying out the provisions of the Florida Legislative Act which impose upon the District the obligation of undertaking "such other works and facilities as the Governing Board may deem necessary for augmenting, and making more effective use of the works set forth in and as shall be provided under such plan."

Close cooperation is maintained with the Corps of Engineers during the planning stages of the project in two ways. A Flood Control District engineer holds regular conferences with engineers in the Jacksonville District Office of the Corps of Engineers to coordinate each step in the development of project plans. When the final plans are completed, these are referred to the Flood Control District engineers for review and acceptance prior to advertising for bids on construction. During the study and design stages of the project, a considerable amount of the basic data on economic, social and physical factors essential to project development is supplied to the Corps of Engineers by the District's Information and Research Department.

Following the completion of plans for each step in the overall program, the District is formally requested to acquire the needed rights of ways. The Legal and Land Department of the District is responsible for all property and right of way transactions, an activity which is both interesting and complicated because much of the land in the District is in such a confused state of ownership. During the years between the collapse of the Florida land boom in 1926 and World War II, much of the land in the area was sold, transferred, or allowed to revert to the State through tax delinquency. Many of these transactions involved

land which had never been surveyed, others were improperly recorded and in a surprising number of cases, the owners had died leaving their heirs unaware of the condition or location of their land. The job of locating properly the land parcels, the present owners and securing title through negotiations or legal procedures has, however been done effectively, if at times somewhat slowly because of these inherent difficulties.

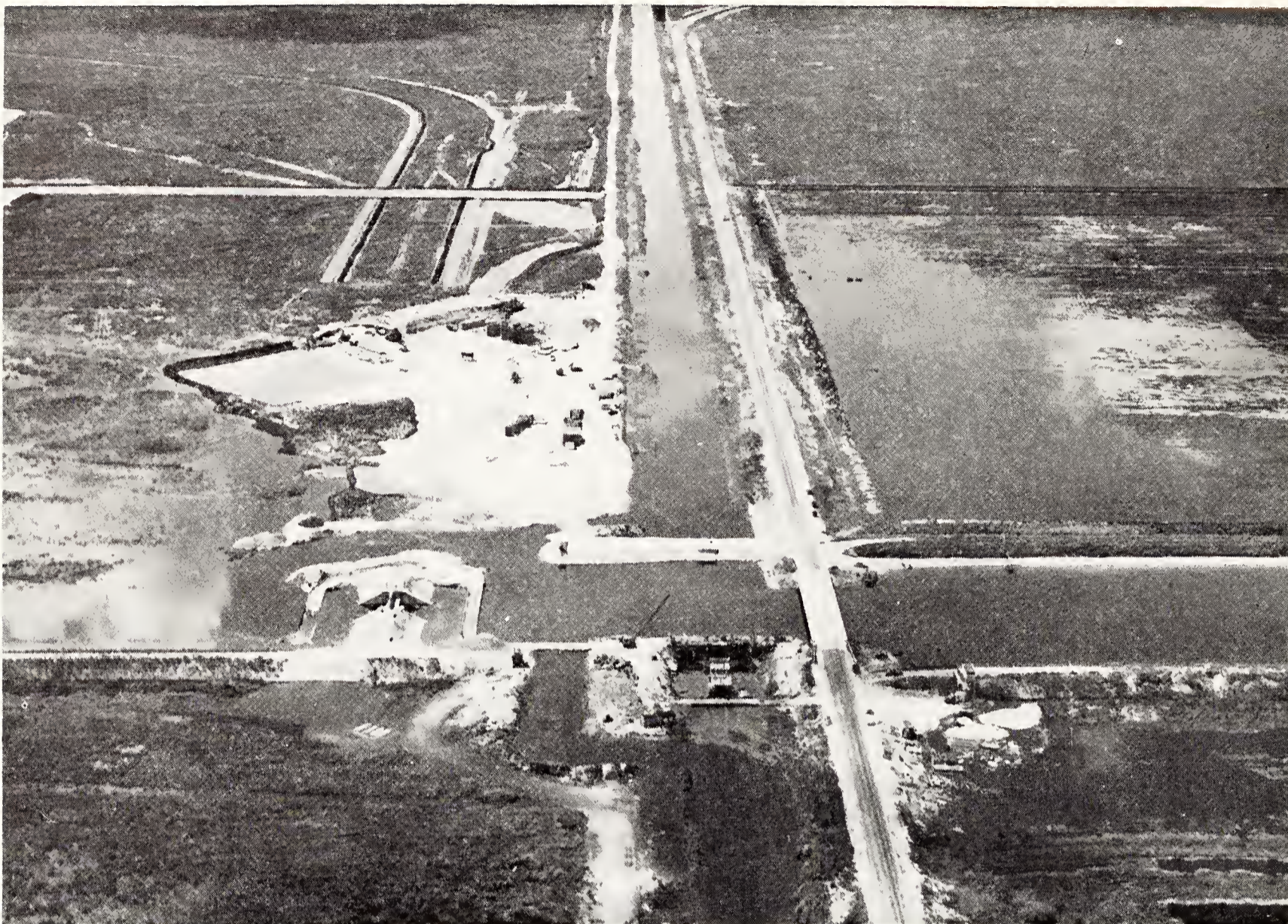
When all rights of way on a project have been obtained and certified to the Corps of Engineers, the works are then ready for the construction stage. At this point the Corps advertises for bids and awards a contract for the construction of the works to the lowest bidder.

Concurrently with negotiations for right of way acquisition, the Flood Control District's engineers proceed with closing agreements and making contractual arrangements necessary to relocate roads, utilities and improvements on public or private property which interfere with the works to be built. The District's responsibility for making these relocations as well as for acquiring rights of way—both prior to construction—are basic obligations under the Federal-State agreement.

As construction is completed by the Corps of Engineers on each individual project of the overall plan, such works are turned over to the Flood Control District as an addition to the system of control works it already operates and maintains. Under present plans for accelerating the construction program under recent and future Federal authorizations, the expanding operating responsibilities of the District will very soon make its maintenance and operations activities one of its major functions.

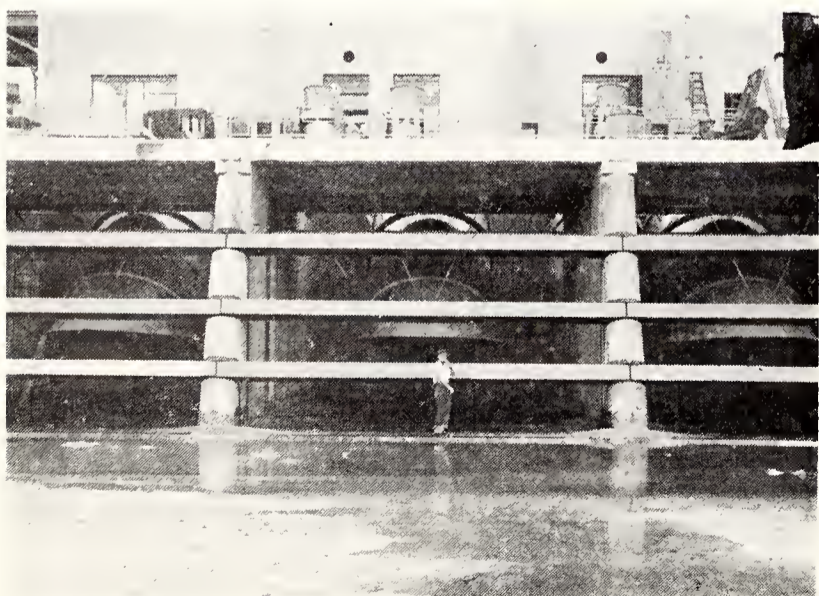
In addition to operating pumping stations, drainage canals and control works as required to maintain optimum ground water levels, provide irrigation water and remove excess flood water to storage or waste, the maintenance and operating unit of the District's organization is constantly engaged in maintaining those control works at the peak of their operating efficiency. This work includes water hyacinth control in the canals, the repair and routine maintenance of new canals and levees and major and minor repairs to the somewhat neglected older canal and levee systems taken over from the former Everglades Drainage District.

Maintenance work is done by the District's forces aided by its own heavy equipment augmented, at



A major control unit under construction at 20-Mile Bend, just west of West Palm Beach. This unit involves a spillway, gated culverts and a pumping station located at the intersection of several major canals and the northern-most conservation area.

Nearing completion is this huge pumping station, due to be one of the largest in the world.



This gated spillway, already complete, is located in the lower left portion of the picture above.



times, by equipment of greater capacity obtained under contract.

Many of the more local features of the project, such as a major system of secondary canals in the Everglades Agricultural Area which are not included in the Federally authorized major project, are designed by the District's engineers and constructed under their supervision. Similarly, the District's engineers are available to aid subdrainage districts and other local planning units in making studies and developing designs for works they initiate.

Of a more urgent nature is the planning and supervisory service rendered by the District's engineers when emergency flood prevention measures must be taken or the actual fighting of flood conditions may be required on occasion.

EXECUTIVE SECRETARY DIRECTS

The Executive Secretary of the District, as its chief administrative officer, is the representative of the Governing Board appointed by the Governor of Florida and is responsible for carrying out the Board's instructions in accordance with official District policies, and for all other activities of the District.

In addition to the more usual divisions under which the District functions in conformity with administrative direction by the Executive Secretary, is one which has, in little more than the past decade, rose from the status of only occasional inclusion as an essential and highly important part of an organizational plan to that of almost universal acceptance by public, private and corporate organizations in this country and to an even

greater extent abroad. This unit is responsible for developing and activating the public relations features of the District's policies and activities and is included in the organizational plan as the Public Information and Research division.

Major activities of this unit which are proving to be of inestimable value are the community relations programs and the information and research activities. An aggressive program of education is carried out to disseminate accurate information on the local level to encourage a better understanding of the aims and operation of the comprehensive plan of flood control and the conservation of water and other natural resources in this important one fourth of Florida's rich territory. The effect of such a program in broadening the initiative and cooperation of the people in the area is reflected in their relations with the District and with their neighbors to their mutual gain.

A continuing program of analysis of the economic, social, agricultural and physical statistics of the area by the research group is now providing basic data for use in the advance planning of primary and secondary systems which was noticeably lacking in the District's earlier years.

The Financial Administration Department is responsible for both fiscal and cost accounting, procurement and warehousing.

The assumption of the financial affairs of the former Everglades Drainage District, in addition to its physical assets and operating responsibilities, entails the supervision of these affairs by the Central and Southern Florida Flood Control District's finance officer until the obligations of this former organization are fully paid and retired in 1955. The old Everglades Drainage District will then pass into history.

Work Accomplished

Construction On Comprehensive Plan

Construction progress on the works in the comprehensive project plan in terms of contracts completed or underway is now (1954) approximately 8% of the total work as currently estimated.

This progress is well under the corresponding 5-year point on the original 10-year projection of progress. In the beginning, limitations placed on the rate of awarding construction contracts by the so-called phase approval element—the step by step construction of a project, the steps often separated by appreciable time intervals—and later by limited Congressional appropriations have materially slowed anticipated construction progress.

With respect to the limited appropriations, it must, in fairness, be said that these undoubtedly were due in part to unsettled national conditions and especially to the effects of the Korean War.

The current increased appropriations and those anticipated for the near future years are expected to make possible materially accelerated construction progress which will be most encouraging to all levels of interest.

To date, approximately 185 miles of levees have been completed.

Since the first phase of the project to be built was approved on an emergency priority basis to offer immediate protection to flooded areas, the works so selected and now completed or under construction are properly considered as among the most important in the overall plan.

In terms of the major objectives of the plan, one significant element has been largely completed—the line of levees (see map) designed to offer basic protection to the heavily populated lower east coast. This levee barrier, running from Lake Okeechobee to lower Dade County, has been completed and accepted for maintenance and operation by the Central and Southern Florida Flood Control District. A number of im-

portant canals in the same area intended to provide more efficient drainage of the developed coastal area are also completed and now afford much of the originally planned protection considered so necessary.

The pumping station located at 20 Mile Bend west of Palm Beach is due for completion early in 1955 and will complete the control units at this spot, the others having already been accepted.

Another immediate protection project completed in the Everglades Agricultural Area is Levee L-1, designed to offer protection to a particularly vulnerable area. (see map)

Also under construction at present are several stretches of levees designed to offer protection to the highly developed agricultural area on the southeast shore of Lake Okeechobee.

INTERIM PROTECTIVE WORK

What is probably more important at this interim stage in the completion of the comprehensive plan is the work of the District in providing emergency protection, both from its own funds and on a cooperative basis, where necessary. These projects have been found necessary to protect present land use and prevent damage. In all instances such works were either unauthorized by the Congress at the time, or, although a part of the project construction, were not included as a project item. Recognizing its responsibility to protect land from damage, or its liability for such damage under the hold and save commitment to the Federal Government, the Flood Control District has spent approximately \$770,000 to date on this type of work. (see map)

Much of this type of work will have a bearing on the comprehensive plan. In many cases, the emergency work has required the acquisition of rights of

way which eventually will be used in the over-all project. In addition, much of the work represents a partial fulfillment of a project unit, so that only a small amount of new work will bring them up to full specifications. This work done by the District should lower the ultimate cost of the project and should be credited to the District's construction contribution account when these works are accepted.

ADDITIONAL DISTRICT ACTIVITIES

The acceptance of local responsibilities and the progress made in building a strong foundation for the program loom large indeed in considering the activity to date. It is this phase which has so attracted attention in higher quarters.

From the very beginning, the District has been aware that much of the success of the program is dependent upon the cooperation of many interrelated agencies, jurisdictions, and landowning groups. The District has sought the assistance of these groups through the organization of the County Advisory Committees, and through meetings with County Commissioners, subdrainage district officials and landowners. The District has been particularly anxious to secure the cooperation of County Commissioners so that county roads and District levees can be tied together into a coordinated and mutually beneficial system.

The District has worked toward coordinating the activities of the subdrainage districts of which there are 34 in its area at present. Agreements must be reached regarding the amounts of water which can be contributed to or withdrawn from the District's system of canals at various water stages. The law which activated the Central and Southern Florida Flood Control District specifically separated the authority of these sub-districts from the major district except where their works connect or where the subdistrict makes use of the works of the major district. However, a high degree of cooperation has been developed on a voluntary basis.

ADVISORY COMMITTEES FORMED

Through the medium of the advisory committees and other special groups, the problems of the various areas are being brought to the attention of the District in time to permit study of suggested modifications in

the original plan and beneficial adjustments made prior to construction.

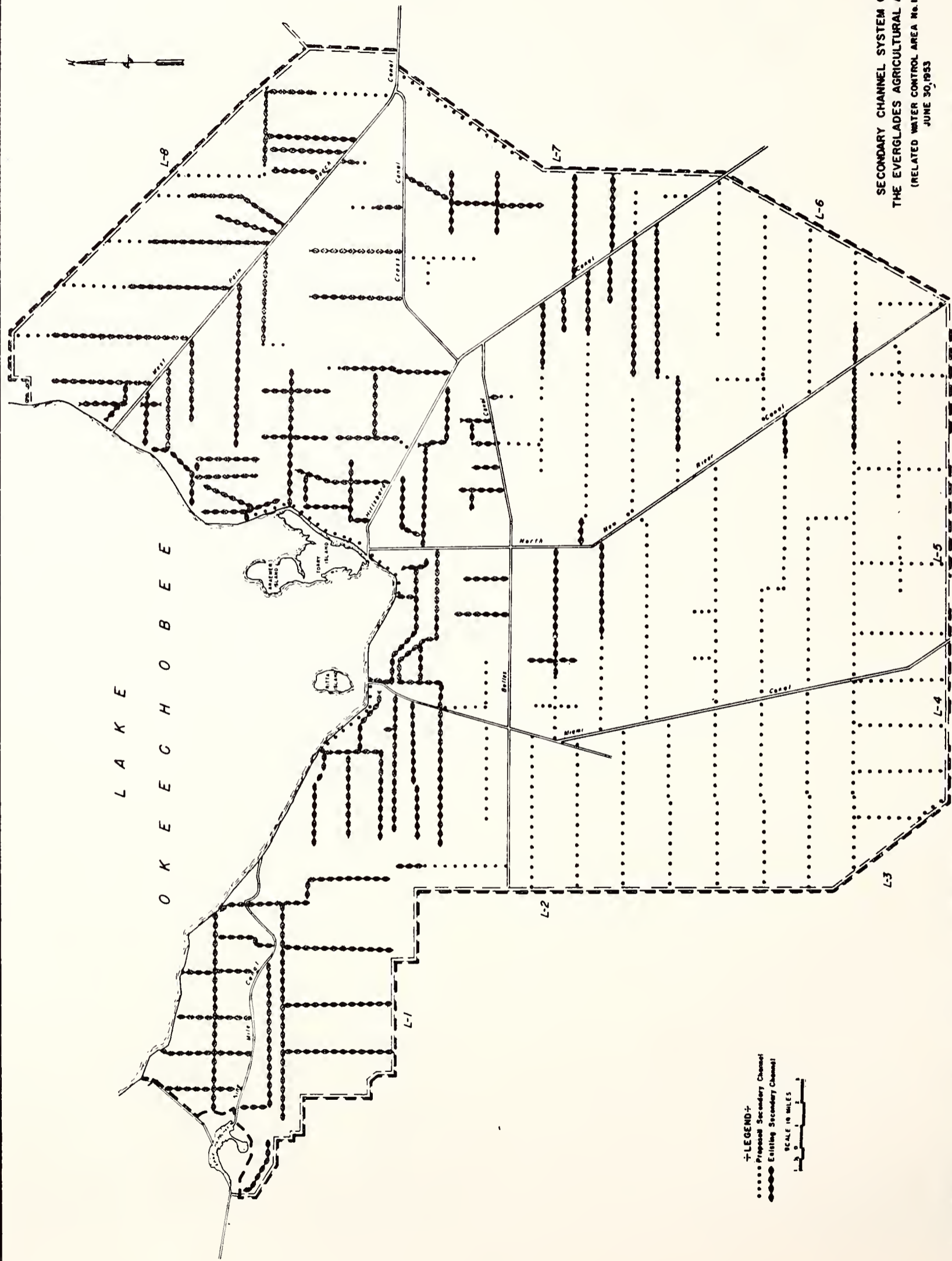
The County Advisory Committee organization has been carried forward with particular effectiveness. Such committees are functioning in 11 of the 17 counties in the District area. The remaining counties either have so little land in the District as to make their representation practicable through adjoining county committees or have old, well-established county agencies carrying on programs. In the latter counties, the cooperation of these agencies is sought. The governing board of the District, for instance, has recently authorized setting up an office in Miami for the specific objective of closer cooperation with the Board of County Commissioners of Dade County and its Engineering Department.

Working through its Field Agent, the District has stimulated the organization of these Committees, seeking to have their membership include representation of all water users. The first was organized in St. Lucie County in 1951. The committees function to iron out local conflicts so that concrete and unified recommendations can be made to the District concerning local interests. They are also the recommending agency for the emergency or interim protective work previously discussed. The District itself works out cooperation between adjoining counties through the committees and offers planning service to all. In several cases where District engineers were not available, the District has paid the fee for a consulting engineer to go into the county and assist the committee with its planning work.

WATER HYACINTH CONTROL

Another secondary activity that has been recently taken over largely by the District has been the continuing problem of water hyacinth control in the canals and drainage ditches. Unsuspectingly imported as flowers about 1888, hyacinths have now become an expensive nuisance in the District's waterways. During flood periods, great masses of hyacinths tear loose and float down the canals, clogging culverts and bridges along the way. The system then overflows with serious damage to crops, dikes and drainage facilities. Even in normal stages, they can so completely clog canals and ditches as to make water movement very difficult.

L A K E
O K E E C H O B E E



LEGEND:
..... Proposed Secondary Channel
----- Existing Secondary Channel
SCALE IN MILES
1 2 3

SECONDARY CHANNEL SYSTEM OF
THE EVERGLADES AGRICULTURAL AREA
(RELATED WATER CONTROL AREA No. 12)
JUNE 30, 1953



This exhibit helps carry the message of the Central and Southern Florida Flood Control Project throughout the area and helps local residents to picture their position in the comprehensive plan.

The effectiveness of the eradication program in the canals maintained by the District is limited by the willingness of landowners to carry on eradication programs in the privately owned ditches which serve the farms in the District. Securing their cooperation has been a major objective of the District's education program.

The program has come along rapidly and has reached the point where it became necessary for someone to coordinate its activities. The District was asked to do so by local groups. The responsibility has been accepted, and the joint efforts are proving effective and economical.

BOARD MEETINGS OPEN

The Board itself has taken every opportunity to carry the problems and achievements of the District

to the people. Its meetings are open to the public and it follows a definite policy of holding these meetings at different places throughout the District each month to enable interested persons from every area to become acquainted with the Board and with the nature of its activities.

Water hyacinths completely block this drainage canal.





These gated culverts provide facilities for passage of water through a main levee as conditions demand for local water control.



A view of the spillway in the Ortona locks in the Caloosahatchee River at Goodno. Scene shows full discharge to relieve flood conditions during October, 1953.

Water for irrigation being pumped from a major canal of the Project into a private canal on ranch property west of Stuart.



Another private irrigation pumping installation near Indiantown. This one provides water for an extensive cattle and vegetable production.



BASIC DATA COLLECTED

The District has made considerable headway in collecting basic data and in presenting it to interested parties. Through its own Information and Research Department it has assembled statistical data which is proving of particular value in the economic evaluations of the project. In a number of instances, methods of computing economic evaluations developed by this department have proved more realistic than accepted practice, and are having their effect on the evaluation of the project.

In assembling accurate data, the District also is working cooperatively with the Soil Conservation Service and its research branch on soil and crop research. Similarly, the Agricultural Experiment Station at Belle Glade provides needed agricultural information. Both the United States and Florida Geological Survey groups are engaged in formation studies and water surveys for the District. These arrangements are providing the District with a quality of data that is proving highly worthwhile.

In the conservation and recreational aspects of the

program, both the U. S. Fish and Wildlife Service and the Florida Game and Fresh Water Fish Commission are tied in with the District. No. 1, the most northerly of three conservation areas, has been leased to the U. S. Fish and Wildlife Service and is now operating as the Loxahatchee National Wildlife Refuge. The other two conservation areas immediately to the south have been turned over to the state agency. Plans are being made for the utilization of the approximately 860,000 acres therein as a refuge and recreation area. Since Florida was once one of the natural wintering areas for waterfowl and abounded with other forms of wildlife, these conservation activities will be watched with interest.

Already the U. S. Fish and Wildlife Service has announced plans for improvement of access to the Loxahatchee refuge for sportsmen, with actual work on canals to begin late in 1954.

In addition to its responsibilities in the planned conservation areas, the Florida Game and Fresh Water Fish Commission has been asked for its recommendations on the maintenance of water levels throughout the system in relation to conservation practices.

A view in the Loxahatchee National Wildlife Refuge, now accessible chiefly by airboats similar to the one pictured. Plans are under way to push canals into the area, making entry possible by other types of boats.





In 1951 water levels brought water at a considerable depth into the main business district at Labelle.



This highway bridge across the Kissimmee River on State Road 60 washed out and broke apart during high water in 1953.

Floods Cover Wide Areas

United States Highway 27 and an Atlantic Coast Line Railroad track washed out west of Lake Okeechobee in 1951.



During the flood of 1947, some of the heaviest loss was in the coastal cities of the lower east coast. This view shows downtown Ft. Lauderdale.



The Future

Aggressive Program Projected

In accordance with recent decisions of the Governing Board of the District, an aggressive program of action is being launched to expedite construction of the Central and Southern Florida project. This is being aimed particularly at the Federal level, since experience has proved to date that the State of Florida has been more than willing to share its part of costs in carrying out the program.

During the fiscal year ending in June 1954, the Corps of Engineers was operating entirely on carry-over funds and had no appropriation for that year. During the last session of Congress, funds were appropriated in the amount of \$4,250,000 to continue construction. In addition, the Corps of Engineers was authorized by Congress to accept advance contributions from the State of Florida as a part of the total cash contribution required by the project in the amount of \$2,900,000. These combined funds became available July 1, 1954, and an accelerated program is already going into the construction stages.

HIGHER APPROPRIATIONS SOUGHT

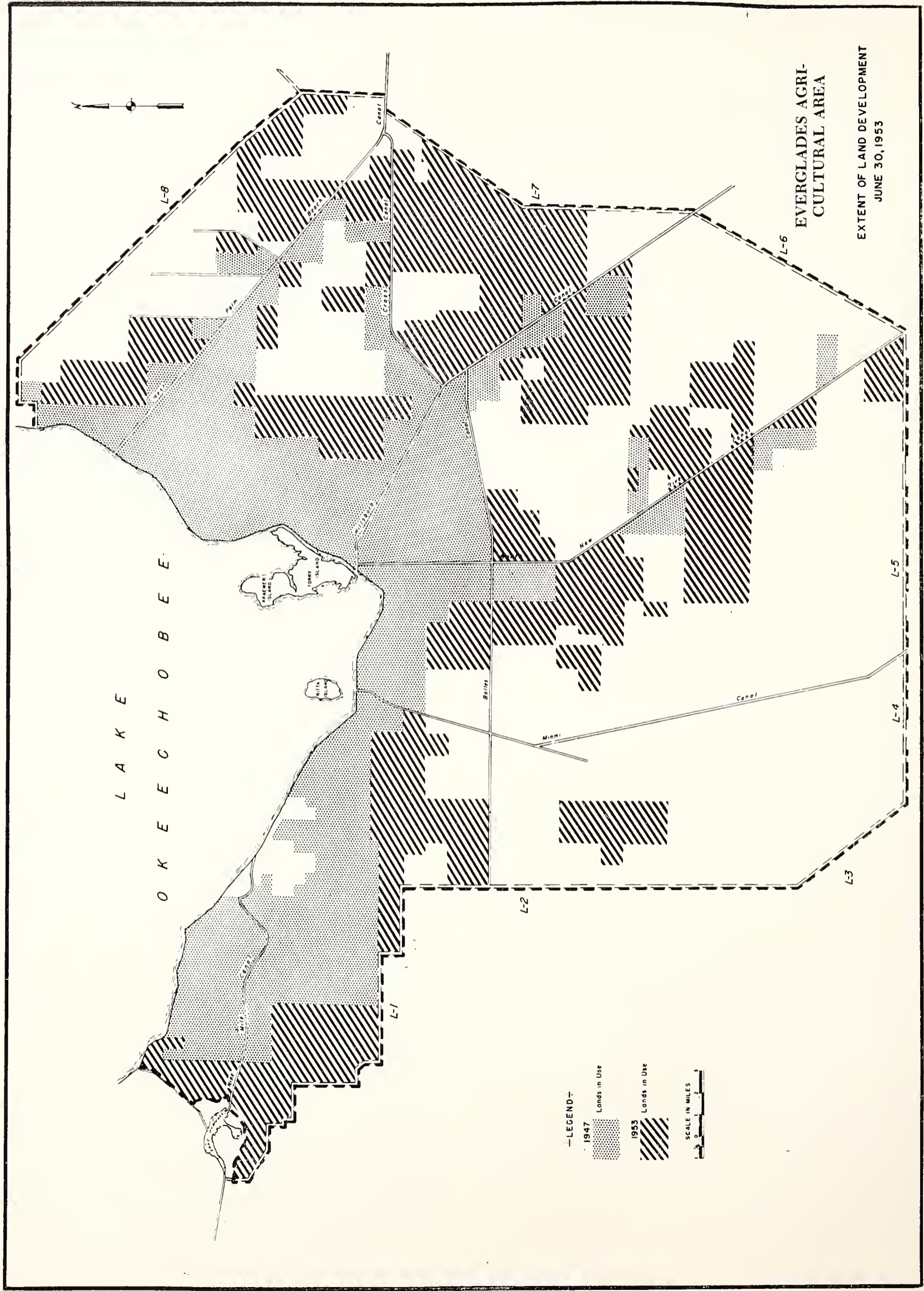
The desirable level for the appropriation of Federal funds to this project for the fiscal years 1956 and 1957 was established in testimony by the Corps of Engineers before the House Committee on Public Works at \$10,000,000 for each year. In the fiscal year beginning in 1958 and continuing on to completion of the project, a level of appropriation of not less than \$25,000,000 annually is being sought by the District with the objective of completing the entire comprehensive plan by Fiscal Year 1963.

In all other respects, the operations of the District seem to be set to follow the pattern of the past years. In a recent policy statement, the governing board re-

iterated the responsibilities stated by previous boards in meeting the legal requirements of local cooperation under the Federal project; in preparing an overall plan for the District; and in representing the people of Florida in their efforts to make the Central and Southern Florida Project fully responsive to the current needs of the area.

To carry out these responsibilities, the following specific policies guide the Board's activities:

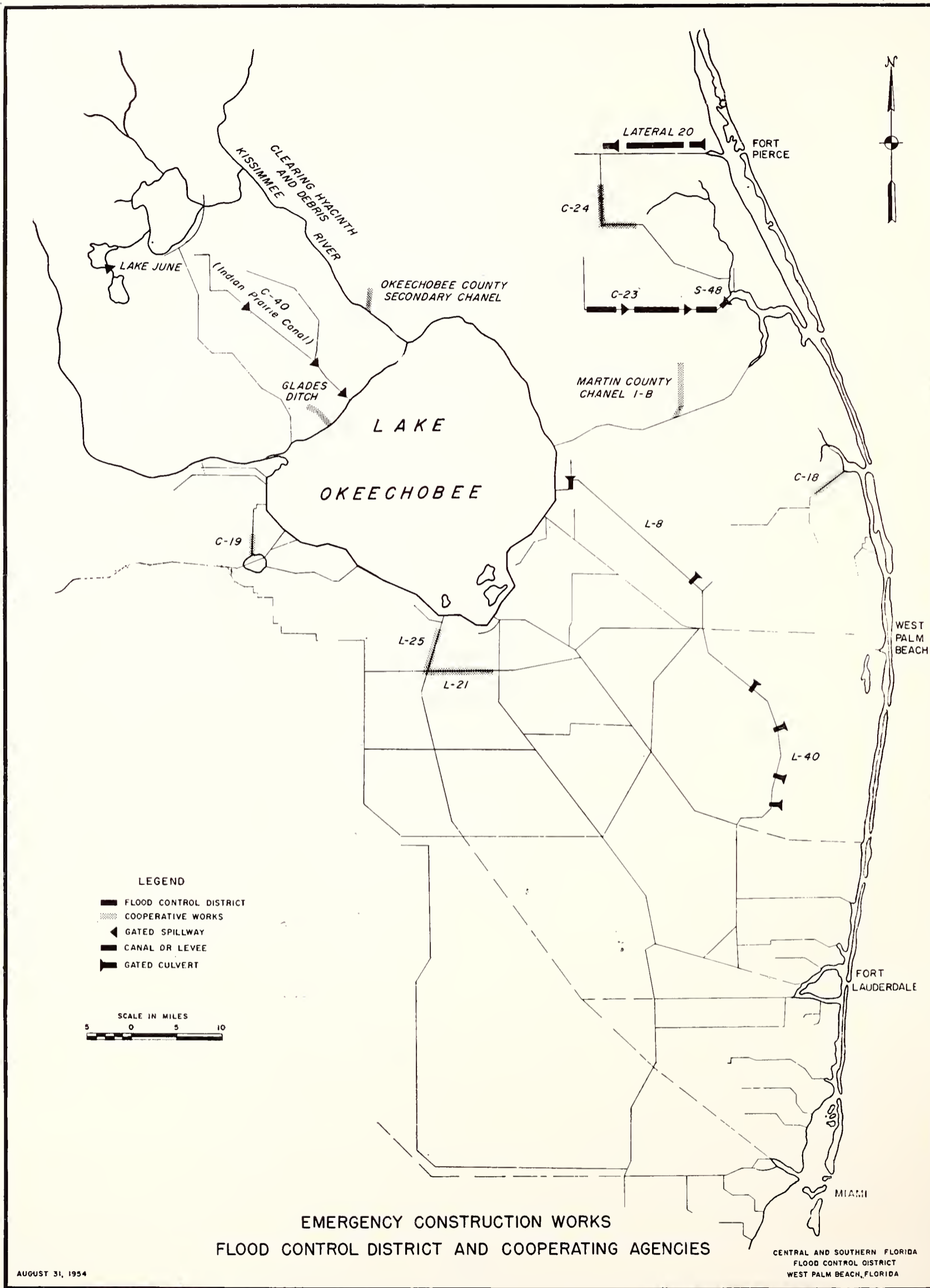
1. Assist the Corps of Engineers, U. S. Army, in the discharge of its responsibilities under the Federal Project.
2. Prepare and keep current, plans of secondary works required to make the Federal-State system of major facilities more effective or of greater benefit in protecting the lives and property of people living in the District area.
3. Encourage participation at the county level in planning the works of the comprehensive plan and the secondary systems.
4. Continue an aggressive program of action aimed at expediting construction of the Central and Southern Florida Project.
5. Disseminate information concerning the project on national, state and local levels.
6. Permit maximum public use of District-owned real property and facilities for recreation, for access roads and for other purposes not in conflict with the primary purposes and requirements of the project and consistent with the requirements of public safety.



7. Cooperate fully with all agencies — Federal, State and local—having an interest in problems of water conservation and control and natural resource development.
8. Increase the amount of and extend the period of time that fresh water is available for:
 - A. Human consumption
 - B. Retarding the intrusion of salt water
 - C. Agricultural, industrial and recreational uses, and

- D. Improving the habitat for fish and wildlife.

Recent action of the Board gave to the Executive Secretary authority to proceed with drawing up plans for carrying out the full implications of the program. This is underway at present and an expanded organization can be anticipated as soon as such a program is fully approved and facilities and personnel become available.



Summary

Firm Foundations Laid

In looking back over the first five years of the Central and Southern Florida Flood Control District, it would appear on the surface that comparatively little had been accomplished to carry out the objectives of the program.

However, in the design and construction of a project closely allied to local needs and of such magnitude and complexity, it is fundamental that an impressive mass of preparatory work, involving studies, research investigations and preliminary designs, which does not show on progress charts, must be accomplished before contract drawings are prepared and construction projects under way meet the eye of the observer.

In the beginning, little real data was available on some of the important phases of the program in spite of the fact that attempts had been made to develop progress for many years. Looking at the early estimates on costs and area development from our present vantage point, it becomes increasingly evident that a better understanding of the magnitude of the program exists today than before and that the program as carried out in the future will be far more realistic than one based entirely on the original comprehensive plan.

At the moment, the major consideration becomes one of accelerating the program in order to get it back into line with estimates as to its necessary completion date. Since the program has lagged, it becomes more necessary than ever to step up the program.

DISTRICT PROBLEMS MULTIPLY

Perhaps the most significant thing to see here is that the area under consideration has developed so much more rapidly than was anticipated. This, of course, has increased the problems of the District many fold and has increased the dangers of flood beyond those existing at the beginning of the program.

A Corps of Engineers estimate in the early stages of the plan saw approximately 260,000 acres in agricultural production in the Everglades Agricultural Area by 1960, yet acreage figures for 1953 show 262,400 in production. This would indicate that land use at present is beyond that estimated for 1960.

Public utilities in the entire area report that expansion has been so rapid that they are unable to keep up with the demands for service.

With the authorization of the entire comprehensive plan by the Congress in the Omnibus River and Harbor and Flood Control Bill of 1954, one of the major obstacles to the efficient planning of the program was removed. This authorization removed another major problem, that of necessary modifications, by including authority for such changes as were deemed advisable by the Chief of Engineers. This clears the way for making the program more flexible and responsive to changing conditions without undue loss of time.

This feature of the bill has already been put to use when the Board of Commissioners recently requested a change in the levee plans for the encirclement of the Everglades Agricultural Area. The original plan called for progressive encirclement to meet expansion needs. Yet, as cited before, the expansion proved so great that the thinking behind the progressive encirclement no longer was valid. Already modifications for total encirclement and the elimination of the progressive plan have been put into the plans now in the hands of the Corps of Engineers.

In many other ways, the project has crystallized and has reached the stage where full action can be taken with more confidence that it will fulfill its mission.

LOCAL PARTICIPATION EMPHASIZED

The emphasis placed on local participation by the

District has developed machinery which enables the needs of the people to be more closely woven into future activity under the plan. The County Advisory Committees are functioning to give concrete guidance in local affairs and a good feeling of confidence has grown that the District and the Corps of Engineers is honestly seeking to develop a program for the overall betterment of the entire area. The public information work of the District has brought about a wider knowledge and understanding of the plan and has aided materially in overcoming much of the original objection to the program.

The organization of the Central and Southern Florida Flood Control District has undergone changes that have made it more effective in its operations, and the official actions of its Board of Governors indicate that the overall objectives of the program and its expressed policies to gain these objectives are ever in the foreground.

NEW FACTORS DEVELOP

Several important items have come to loom larger in the thinking of all groups. Among them is the consideration of the municipal water supply problem which has rapidly become a major consideration in all planning.

This problem is becoming more critical throughout all parts of the country and the people in the District are looking to it for assistance. Already several programs are being coordinated with District planning in connection with providing immediate or future municipal supplies.

Another is the effect of the tremendous development of the area far beyond the expectations of the original planners on the general evaluation of the project in terms of both flood damage and land use. Since 1948, an average upturn in the value of all property in the District of better than 50% by 1953 was recorded, with better than a 62% increase for that part of the District south and east of Lake Okeechobee. In the highly concentrated areas these figures go still

higher, with Dade County showing a 67.9% increase since 1948. This increase throughout has placed an entirely new light on evaluations since much of this added evaluation has come as the result of extended land use made possible by District control and conservation works already in service or assured for the near future.

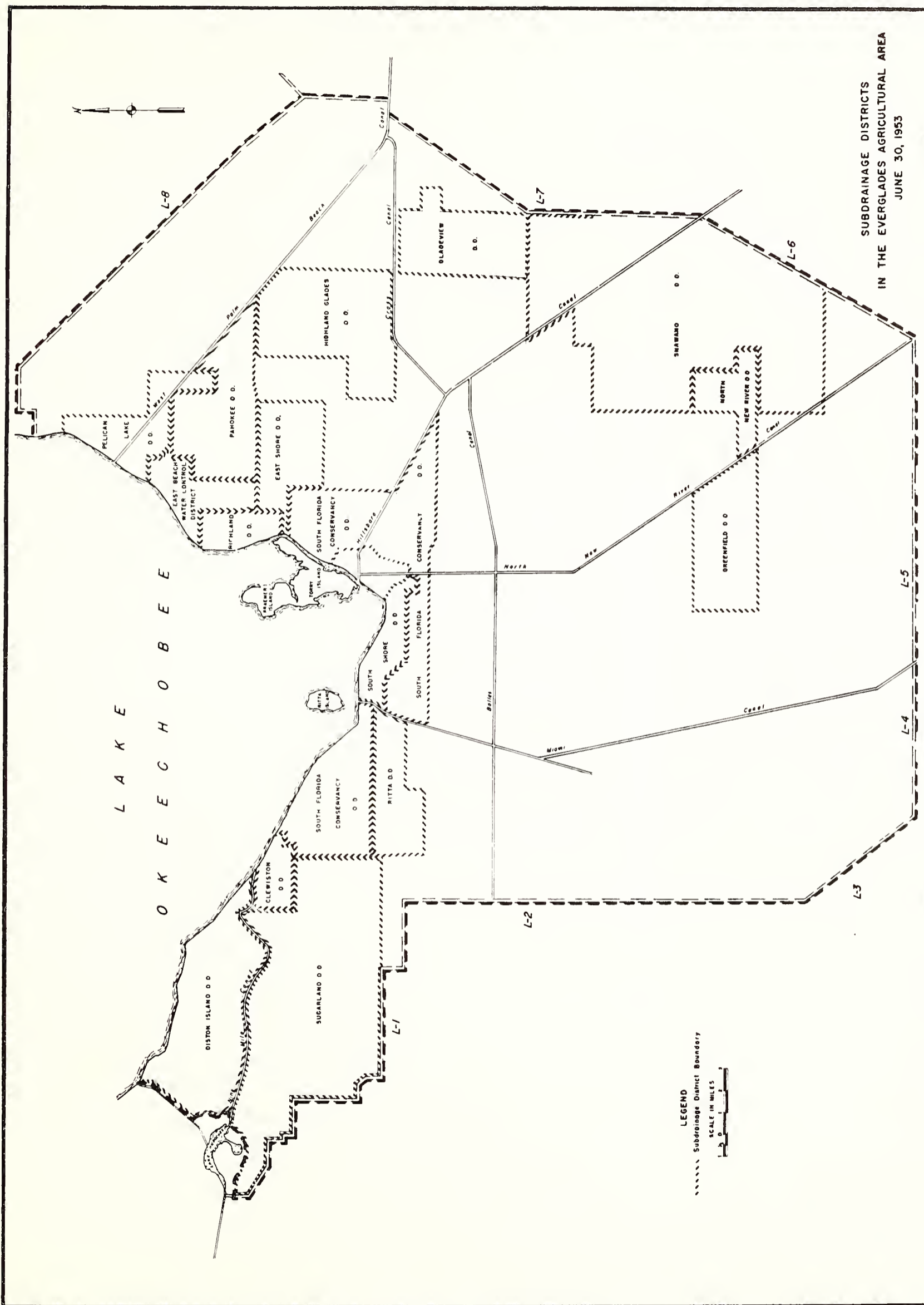
The stage seems to be set for putting the comprehensive plan into full operation. The operation of the District, particularly in its local participation angles, has captured the interest of the Hoover Commission on Reorganization of the Executive Branch of the Government through its Task Force on Water Resources and Power. This Task Force seemed much impressed with what they saw in Florida on an inspection tour, what they learned first-hand from discussions with private landowners directly affected by the project and from factual reports presented at public hearings in New York.

CONCLUSIONS

The first five years of the District's existence have been most eventful. Construction is well under way, engineering is far ahead of construction, authorization of the comprehensive plan has been obtained and the cooperating agencies at all levels of government are accustomed to working harmoniously together.

The public is better informed than ever before of the purposes, capabilities and limitations of the project. Interest in the project is increasing in Florida and throughout the country.

The project is well launched. The continued cooperation of individual land owners, drainage districts, the 17 counties directly affected, the State of Florida and the Federal Government will assure early completion of the comprehensive plan. The value of this investment in natural resource development and conservation is already apparent. The benefits of the completed project and essential related works will exceed the most optimistic estimates made to date.



**SUBDRAINAGE DISTRICTS
IN THE EVERGLADES AGRICULTURAL AREA
JUNE 30, 1953**

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